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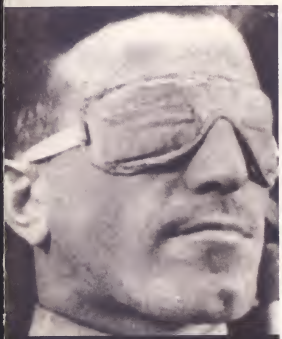

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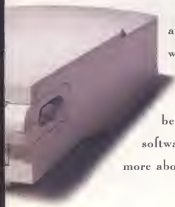

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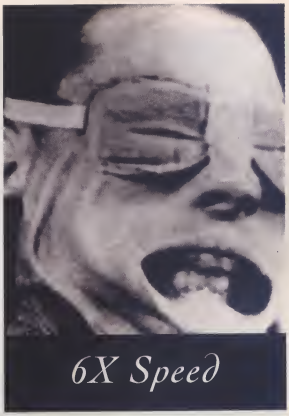

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Diskette Drive	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB
Expansion Slots (Total)	3	4	5
Drive Bays (Total)	3	4	5
Ports: Serial/Parallel	1/1 (ECP)	1/1 (ECP)	1/1 (ECP)
Security Features	Yes	Yes	Yes
101-Key Keyboard, Mouse	Yes	Yes	Yes
Software Preinstalled	MS-DOS® 6, MS-Windows® 3.1	MS-DOS 6, MS-Windows 3.1	MS-DOS 6, MS-Windows 3.1
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Gotta Get a Gigabyte

The bad news: You're out of hard disk space. The good news: Our labs tested 20 SCSI and Enhanced IDE storage solutions that cost as little as 23 cents a megabyte. Discover your best options. **130**

The Sharpest Image

A bigger monitor is your instant ticket to easier and more productive Windows. Here's how thirty-three 17- to 21-inch monitors stacked up in our lab tests. **142**

The Fastest True-Color Cards

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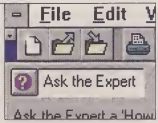

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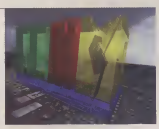

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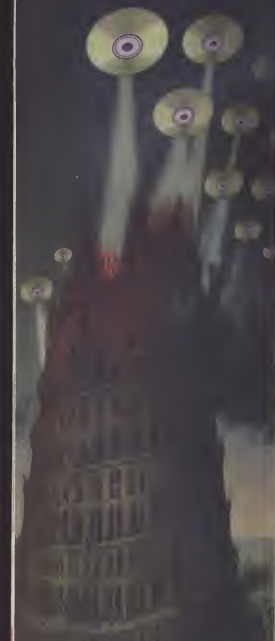

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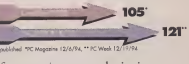

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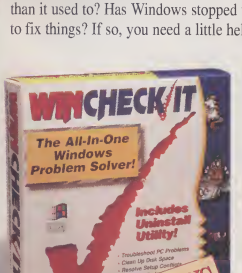

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OR A THOUSAND WORDS.

I have this vision of Monument Valley in my head. You see, I've never actually been to Monument Valley. I've read about it in books and magazine articles. I've seen it in the television commercials for pick-up trucks and in the movies; you know, the exciting, old westerns. The buttes and the mesas; it's funny how those words rarely come up in conversation, but I'm sure if you were face-to-face with a massive, towering butte, it would stop you in your waffle-footed tracks. That's what I like about nature—its ability to remind us all that we humans are merely short-term inhabitants of our mighty Mother Earth. It's the magnificent red-hued rocks that leap up towards the breathtaking sky; [illegible] of concrete and steel, man-made monuments that fool us into believing that we too can create in a moment what the gods of this arid world have taken forever to construct. There is a seventeen-mile drive that winds through the ragged heart of Monument Valley. I've read that the drive provides visitors with sweeping views of the valley from different vantage points. I suppose, if you were in a hurry, this would be the way to see this place. But it's not the method I would use (why would you come here if you were in a hurry?). I'd get on a strong horse and ride wherever I wanted to go. I'd ride right up to the big rocks and stare straight up to the sheltering sky. I believe a place like this [illegible] monuments are remnants of sandstone eroded by the million-plus-year effect of wind and water. You can't not think about your insignificance in the cosmic scheme of things, standing amid a world that does not know hamburgers by their names, the year's top money-making films, or the most-valuable player in last year's Super Bowl. Places like Monument Valley, Yosemite, and the Grand Canyon are pure. Yes, that's the word: purity. The towering pinnacles, the volcanically-inspired buttes; they are there day after day, year after year, generation after generation. Yes, always changing, but slowly, subtly, almost imperceptibly. They are in no hurry to go anywhere. Where would they go? Why would they need to? No, they have already arrived. So it is we humans who go to them, we Mohammeds to our mountains. In our shiny new four-wheel drives and recreational vehicles. We go out from the towns and cities in droves. We go to sit at the foot of these geological icons of the American West. We go to touch our own Indians. To find some connection between what nature has carved out of this ancient place called Monument Valley and our own modern lives. Of course, I suspect most of those who come don't—or can't—see the connection. The monuments of our settled lives are made [illegible] Because it is of a world that means absolutely nothing from us. It is a self-sufficient kingdom of layered sediment, simultaneously eternal and impermanent. Nothing we say or write about Monument Valley makes it more or less powerful. Yet we are moved to react to its noble beauty. And in reacting, we praise the purity—there's that word again—of this place. And, in appreciating Monument Valley, we learn to appreciate what is good and important in our lives. The immutable laws of nature remind us to stop and smell the flowers, to cherish our children, to revere our parents and grandparents, to love one-another as we love the majesty of these monuments. This place is a magical looking-glass through which we may see the true character of our souls. I have this vision of Monument Valley in my head. And when I see this vision, I feel closer to a world that embraces me; a world that invites me to share in the sovereign beauty of rocks that rise towards the heavens and dunes that run forever. They remind me that, no matter where I go and what I do, I will always feel these monuments in my heart. I will always hear the chattering wind in my head. I will always see the extraordinary silhouettes of the ages. And I will always find a reason to keep going forward. I have this vision of Monument Valley in my head..

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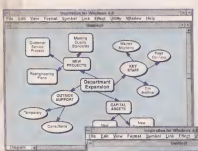

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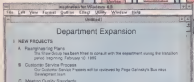

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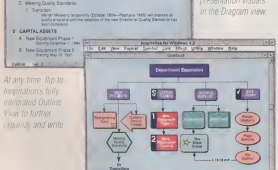

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Forget Princess phones! PC-based telephones are now the kings of the dial tone. For a peek at the latest innovations in computer-to-telephone integration, see page 286.

The Waiting Game

Eleventh inning stretch: Lasting even longer than the baseball strike, the waiting game for Windows 95 left much of the PC industry sitting out a whole season on the sidelines. But with the Windows 95 preview edition in the hands of hundreds of thousands of early adopters, and with the commercial release warming up in the bullpen, it's a whole new ball game. When Windows 3.0 came up to bat, software vendors grabbed their chance to shake up the standings from the DOS regime, and the flood of Windows 95 upgrades later this year will prompt a similar scramble. That's particularly true of apps and utilities that now find themselves competing with features built in to the operating system for the first time. Over the coming months, we'll spotlight many of these showdowns. In this issue, we focus on the changing face of remote access and remote control (see "Dial-Up Desktop," page 177).

The Three-Year Itch Not every major application is idling on the bench until the Windows 95 post-season playoffs. With a complete usability overhaul and a new lineup of home-run features, Lotus Word Pro, the new incarnation of Ami Pro, gets a head start on the competition. Associate Editor Kyla K. Carlson's hands-on sneak preview appears on page 60. Kyla notes, "It's been three years since Lotus released a major rev to Ami Pro. The stakes are high in this game, and Lotus is back in—and playing for keeps."

Playing the Slots Record-smashing CPUs are coming out so fast you'll need a 133MHz processor just to keep score. Dell's new 133MHz screamer (reviewed on page 66) is the latest champ, but that won't last long. Of course, CPUs are only part of the story. Extended data out (EDO) memory, bigger caches, improved EIDE, and the new industry-standard PCI bus are also big reasons why we have to log our record-book entries in pencil. But as Technical Director Adam Meyerson points out, there's usually a catch: "There are always a few uglies when a spec first comes out, and PCI is no exception. In this month's look at hard drives [see "Gotta Get a Gigabyte," page 130], we found that early PCI systems couldn't map IRQ 14 to any of the PCI slots. When you add an EIDE disk controller that will run the boot drive, you have to rig it with a paddle card about the size of a SIMM. That takes up one of your ISA slots as well as a PCI slot—a real waste."

Under Cover In our story on how to get on the Net (see "One-Click Internet," page 114), we modestly left out one of the best solutions: The latest edition of the *PC Computing* CD-ROM includes ready-to-run software for every major online service, and features a multimedia guided tour of everything you need to understand the inner workings of the Net. Call (800) 537-4680 to order.

Demo of the Month You might have thought that Delrina's Echo Lake family scrapbook software (see page 36) would get the kind of drubbing the pundits generally reserve for hokey and precious Mac software. But at its public unveiling at the Demo 95 industry trade show earlier this year, more than a few hardened journalists and tough-as-nails venture capitalists could be seen discreetly dabbing hankies at their eyes. And even before its release, its innovative interface had already become an adjective for software designers seeking to mimic an Echo Lakey look.

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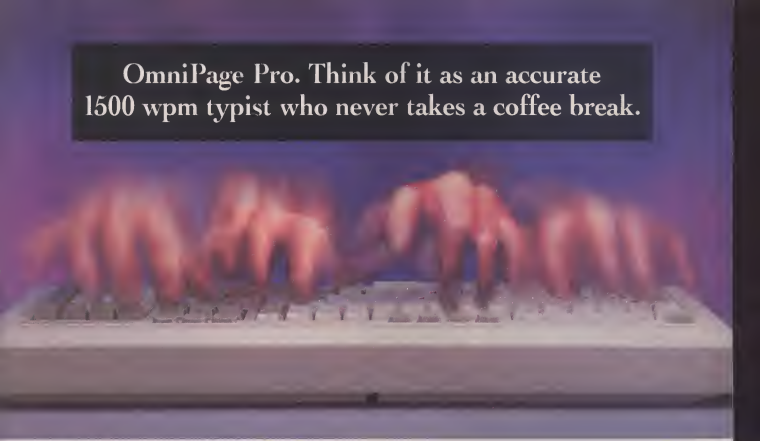

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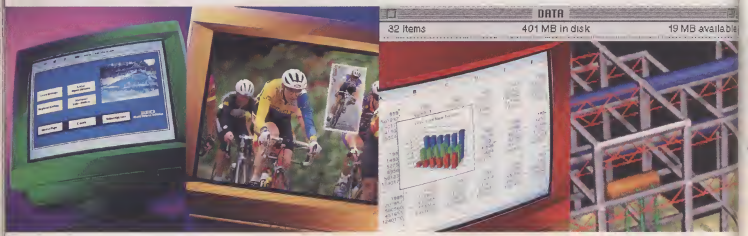

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I enjoy the fact that equipment becomes "obsolete" within a year or two. When the 486 was the hot ticket, I bought a 40MHz 386 for under $100. When everybody decided they couldn't live without a 90MHz Pentium, I got a deal on a 80MHz 486 for under $200! My machine runs all the software I have quickly and reliably. And I have the added bonus of feeling I got a bargain in the process. Today's bleeding-edge screamer is tomorrow's bargain, as Gil Schwartz has said. Keep buying those Pentiums, folks—and grab a bunch of P6s when they hit the shelves. I can't wait to lay my hands on a 90MHz Pentium for $200 in a year or so.

NICK CHANDLEY
VIA THE INTERNET

To Be or Not to Be Techie

Reader Wing Gin Lam expressed in the May issue ("School of Hard Knocks," Mail, page 27) a hatred for Plug and Play because it doesn't teach users how computers really work. Lam has apparently avoided the long hours of frustration when attempting to install a "simple" add-in card or device. You can't expect the inexperienced user to understand interrupt conflicts and device-contention problems. Plug and Play should have been part of systems from the beginning. Those who want to learn about their hardware are more than welcome to take apart their machines down to the last nut and bolt.

ROBERT MCDONALD
VIA THE INTERNET

A Plug for Plug and Play

You don't need to know what makes computers tick to take advantage of a great technology. Wing Gin Lam would have us all needing to know how to disassemble and rebuild automobiles before we could ever drive one.

EDWIN P. DABNEY
VIA AMERICA ONLINE

Words of a Perfect Comeback

In his May column, John Dvorak comments that "Novell will drop the WordPerfect ball and we can expect it to go the way of DisplayMate, MultiMate, Volkswriter, WordStar, and XyWrite, to name a few . . . " (page 55). I'd like to set the record straight. WordPerfect is the world's most popular word processor, and sales of Version 6.1 continue to climb, rivaling sales of Microsoft Office. WordPerfect 6.1 has also received better reviews than Word 6.0 and was voted top word processor in all the major Windows publications. It's even a three-time winner of *PC Computing*'s prestigious MVP award. Finally, WordPerfect is part of the PerfectOffice suite, which has won every major suite review since its launch and is quickly surpassing Lotus SmartSuite as the second-best–selling suite.

GLEN MELLA
VP OF MARKETING, NOVELL BUSINESS

If You Can't Beat 'Em, Buy 'Em

Paul Somerson needs to get a grip. In his May column ("Spork You," page 51), he says Microsoft is being punished for "savvy management" and "brilliant marketing." What he forgets is those same words once described a telephone company called AT&T. Somerson says the way to win is to make better products. But look at what happened to Intuit: It controlled the home finance market with a great product. Microsoft's reaction? If you can't beat them, buy them!

JOHN H. EACRETT
VIA COMPUSERVE

New World Order

Dvorak, you're a Chicken Little. If we're to believe your "Juggernaughty" column in the May issue (page 55), Intel and Microsoft are locking up the computer scene forever. That will happen only if infighting and litigation continue to be the main means of competition. Things may break sooner than you think. New players from the telecommunications and entertainment industry will enter the fray—and the info superhighway is too big to be a monopoly. We're going to need a new generation of products—not the incremental steps Intel and Microsoft are taking.

JIM LEWIS
VIA AMERICA ONLINE

Stop the Microsoft Bashing

It's time someone defended Microsoft ("Juggernaughty," May). It's the American way to work hard, take chances, and enjoy the benefits. Am I wrong to envy a college dropout who became a billionaire before he was 40 and is worth close to $10 billion?

BOB KOBER
VIA THE INTERNET

A Shocking Revelation

I read the Q&A section in Working Smarter (Help, May, page 206), and you must be winking with tongue firmly in cheek when you say you used your hands to test for static electricity. In order to feel a static charge through your hands, the charge must be in the neighborhood of thousands of volts. Damage to integrated circuits and other components in the circuit boards can happen when static creates voltage in the

hundreds of volts! While the damage may not be immediately apparent, the latent damage can cause all kinds of havoc—usually at the wrong times. By connecting the screen to the back of the computer, static buildup that is generated will be safely grounded through the power plug (provided the outlet is properly grounded).

JEFF MORRELL
VIA THE INTERNET

ZAP! You're right—you can't test for static with your hands. But we still stand by what we said: There's little need to ground an antistatic screen to the computer case. **JOC**

Free Net, Not Bombs

Since the disaster in Oklahoma City, I heard that Congress may impose restrictions and monitor the Internet because the bombs within the Oklahoma building were presented in an offer on the Net. I know the Government constructed the Net through the Department of Defense, but now it belongs to the general public. Censorship not only disrupts the everything-you-can-think-of nature of the Net, but also conflicts with user privacy.

JOHN ELLIS
VIA THE INTERNET

Senseless Censors

It's obvious the Feds are anxious to get their hands on free speech via the Net. I'm glad no one was around to censor the Holy Scriptures and remove everything they thought was objectionable. It would be interesting to know whether or not Senator James Exon knows what the Net is all about. He doesn't even have an e-mail address.

MERLIN WRIGHT
VIA THE INTERNET

More Free Stuff

I-Way Patrol is my favorite section. By the way, under Free Stuff! (May, page 296) the correct location for the CAD program tscad20.zip is /SimTel/win3/cad.

GREGORY T. LUND
VIA THE INTERNET

DULY NOTED, and we might add the standard disclaimer: The Web is dynamic by nature, and Web sites, URLs, and FTP servers are subject to constant change without notice. **RS**

For the Record

- In the May "Maximum Impact" feature (page 114), Microsoft's PowerPoint 4.0 for Windows should have been priced at $339.
- The name of the Diamond Command Center telephony board reviewed in the May issue ("Hello. This Is the Future Calling," page 76) has since been changed to TeleCommander 2500XL.

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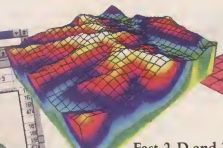

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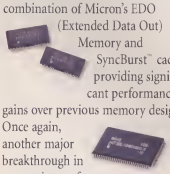

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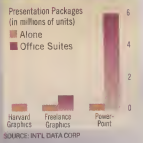

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WIRELESS UPDATE

Infrared On the Rise

Cut the Cord: Infrared-equipped printers, notebooks, and other devices are leading the desktop wireless revolution.

Cables are hell. Is relief in sight? While spread-spectrum radio LANs lurk on the misty horizon, scores of standards, security concerns, and reliability issues need to be resolved before wireless networks free us of our cables. Meanwhile, infrared, an oft-overlooked technology, is quietly providing an inexpensive, savvy, and useful toehold to the world of wireless computing. In fact, it's leading a veritable revolution.

Don't blame the technology itself for infrared's bad reputation. In years past manufacturers have found some remarkably bad uses for it (such as connecting a keyboard to a PC, as IBM tried to do with its failed PC Junior). Nor is slow throughput one of infrared's drawbacks. Plans are already underway to raise transmission speeds from the current 1.5Mbps to 4Mbps and eventually 10Mbps.

But why the sudden interest in infrared after years of disfavor? Three key factors have rehabilitated it: a settling of standards, aggressive support from technology leaders, and price.

The Infrared Data Association (IRDA), which claims heavy hitters such as Hewlett-Packard, IBM, Compaq, and Intel among its members, has led the way. The formal IRDA standard grew out of a de facto industry standard set by Sharp and Hewlett-Packard primarily for their handheld devices. The current version of the standard, IRDA 2, received broad industry acceptance immediately after its introduction.

The IRDA 2 standard isn't languishing on paper either. HP, for example, now includes two-way infrared across most of its product line, from the OmniBook portable PCs to desktop systems and the flagship LaserJet V printer. And infrared is now standard equipment on all IBM and Sharp portables, and even low-price leaders such as Gateway 2000 have begun to include it on systems. Meanwhile, the list of PC

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PHOTO ILLUSTRATION BY PETER ALAN GOULD

Wire, RAM Shortage

Card and serial-port infrared add-ins continues to grow.

But support isn't coming just from hardware. Windows 95 will include infrared drivers, making wireless printing from any portable device simply a matter of mouse clicks. Traveling Software's LapLink for Windows has long provided for infrared file transfers; look for other utility makers to provide similar capabilities in the coming months.

Will infrared LANs be next? No, the technology can manage only line-of-sight transmission, although "diffuse transmitters" in which two infrared devices located anywhere in a room can communicate are quickly heading to market. Still, infrared can't penetrate walls. A drawback? Yes, but it also relieves a number of security and privacy headaches, especially for printing from portable devices.

Infrared's benefits don't stop there. Transceivers require little space and consume insignificant amounts of electricity—crucial issues for portables and handhelds. But the best reason to bet on the future of infrared is cost: A transceiver adds less than $5 to the cost of a system, portable or otherwise. **MJ**

Road Trip Toshiba America has announced a new car navigation system that may mean you never have to unravel a road map again. The Toshiba NAV1000 consists of a CD-ROM drive with a 5-inch color LCD screen, built-in speaker, remote control, GPS antenna, and EtakGuide CD-ROM map. Local maps of California will be available in October, and maps for other regions will follow. Better yet, the $2,999 Toshiba NAV1000 also plays audio CDs. **MH**

ISDN for Everyone

The I-Way has few 28.8Kbps gateways, and graphics download like **molasses** over a 14.4Kbps modem. The answer? An **ISDN line,** which the Baby Bells now offer at reasonable rates. But you still need an ISDN modem. Try the **SecureLink II,** which permits uncompressed data transfers at 128Kbps. A **dual-channel** version that lets you talk and send data over a single line simultaneously is also available. **MH**

SecureLink II / ISDN Systems Corp. / (800) 566-9472 / $359 est. street price ($549 for dual-channel version) / *Reader Service No. 604*

Pentium Notebooks

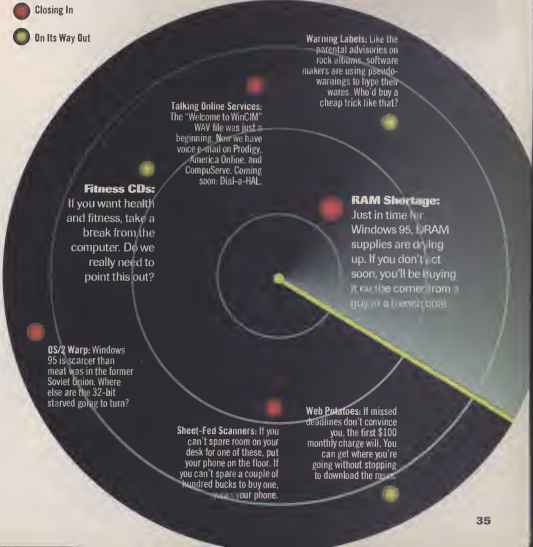
Fierce road warriors require fast notebooks. We searched for the best prices on Pentiums with 8MB of RAM, a 340MB or larger hard drive, and a color display. Results as of April 21, 1995.

Product	Price
Elite SoundBook Plus Dual Scan P5-75 *MidWest Micro (800) 972-8822*	$2,999
NEC Versa P *USA Flex (800) 477-7770*	$4,299
Toshiba T4900CT *Kensaku Computer Center (800) 255-2989*	$5,399
TravelMate 5000/75 *Texas Instruments (800) 848-3927*	$5,899

Reader Service Numbers: MidWest Micro *603*; USA Flex *606*; Kensaku Computer Center *607*; Texas Instruments *608*

RADAR: Online Services Talk Back, RAM Runs Dry

What's on the Scope? If a blip is near or moving toward the middle of the radar screen, check it out. If it's moving off the screen, steer clear for now.



Snapshots from Your Computer

Who needs film? Shutterbugs can snap photos with filmless digital cameras and download images right to their PCs.

The most sophisticated new digital camera is Apple's color QuickTake 150. New to this model are better image management software, longer lasting lithium-ion batteries, and a new lens attachment for close-ups. It sells for $600 on the street.

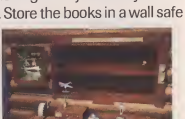
Similar in design and operation to the QuickTake is Logitech's color FotoMan Pixtura. Just attach it to your system's serial port and start snapping. The $895 device holds 48 high-resolution snapshots in memory at 768 by 512 resolution or 144 images at 384 by 256 (the QuickTake holds 8 images at 640 by 480 resolution or 32 images at 320 by 240).

For a less expensive option, Connectix offers the $99 black-and-white QuickCam. The size of a billiard ball, it attaches to your system's serial port and is controlled completely by software. The QuickCam also does movies: Record a series of still frames, and the software turns it into a video sequence. **WT**

QuickTake 150 / Apple Computer / (408) 996-1010 / $600 est. street price / *Reader Service No. 609*
FotoMan Pixtura / Logitech / (800) 231-7717 / $895 est. street price / *Reader Service No. 610*
QuickCam / Connectix / (800) 950-5880 / $99 est. street price / *Reader Service No. 611*

Nostalgiaware: The Multimedia Scrapbook Niche

Does a personalized digital photo album/storybook appeal to you? The radically new **Echo Lake** captures and stores your family stories and pictures with an interface that evokes an old-fashioned home—replete with its main screen of a log-cabin office and a **cup of java.** Clicking on objects lets you add **pictures, movies, text, and sounds** to journals. Store the books in a wall safe (with password protection) or distribute run-time copies via disk or e-mail. Simultaneously inspired and hokey, if you don't tell Mom and Dad that it's a **multimedia authoring tool** and digital archivist, they just may go for it. **JOC**



Echo Lake / Delrina / (800) 734-2330 / $49.95 est. street price for floppies, $59.95 for CD-ROM / *Reader Service No. 612*

MICROSOFT PLUS

The Unessential Windows 95 Toolkit

Microsoft's first add-on product for Windows 95 is: A) a valuable set of utilities for people with fast PCs, B) a clever way to buy extra development time for a couple of buggy Windows 95 features, or C) a way for the Redmond, Washington, software giant to make extra money from Windows 95 buyers. The answer, of course, is D) all of the above.

Microsoft Plus for Windows 95 is a $50 collection of utilities targeted at users with fast CPUs. There's nothing absolutely essential in the box, but Microsoft is betting that Pentium users will find the collection irresistible.

I-Way Jump Start: Among Microsoft Plus's utilities is a Web browser and Internet setup wizard.

Part of it is pure silliness. The Microsoft Plus package includes coordinated sets of animated cursors, wallpaper, sounds, and the like organized into 11 desktop themes. In The Sixties, for example, the My Computer icon is a pink Volkswagen bug, while the Inside Your PC theme puts up a circuit board for wallpaper. The package also provides full-window dragging (to see a window's contents as it's being moved) and smoothed TrueType fonts.

On the genuinely useful front, Microsoft Plus includes two agents that handle basic tasks. The System Agent runs applications at predetermined times (for example, the install routine sets up ScanDisk and Defrag for hard-disk maintenance), and the Compression Agent uses the enhanced DriveSpace 3 to do advanced disk compression. Common DriveSpace headaches are fixed in this version, with support for volumes of up to 2GB (the current version stops at 512MB) and higher compression ratios. It also lets you mix compressed and uncompressed files on the same volume, which means that you can selectively squeeze files that haven't been touched in, say, 30 days without touching files you use daily.

The final Microsoft Plus piece is the Internet Jumpstart Kit, which includes Internet Explorer (Microsoft's enhanced version of the NCSA Mosaic Web browser), an SMTP mail provider that brings Internet e-mail directly to the Windows 95 Exchange in-box, and a Setup Wizard that configures it all. Eventually Microsoft plans to offer its own direct route to the Internet via The Microsoft Network and other avenues, but that system won't be available until the end of 1995 or later. Microsoft Plus is expected to be available shortly after Windows 95 ships. **EB**

Microsoft Plus / Microsoft Corp. / (800) 426-9400 / $50 est. street price / *Reader Service No. 613*

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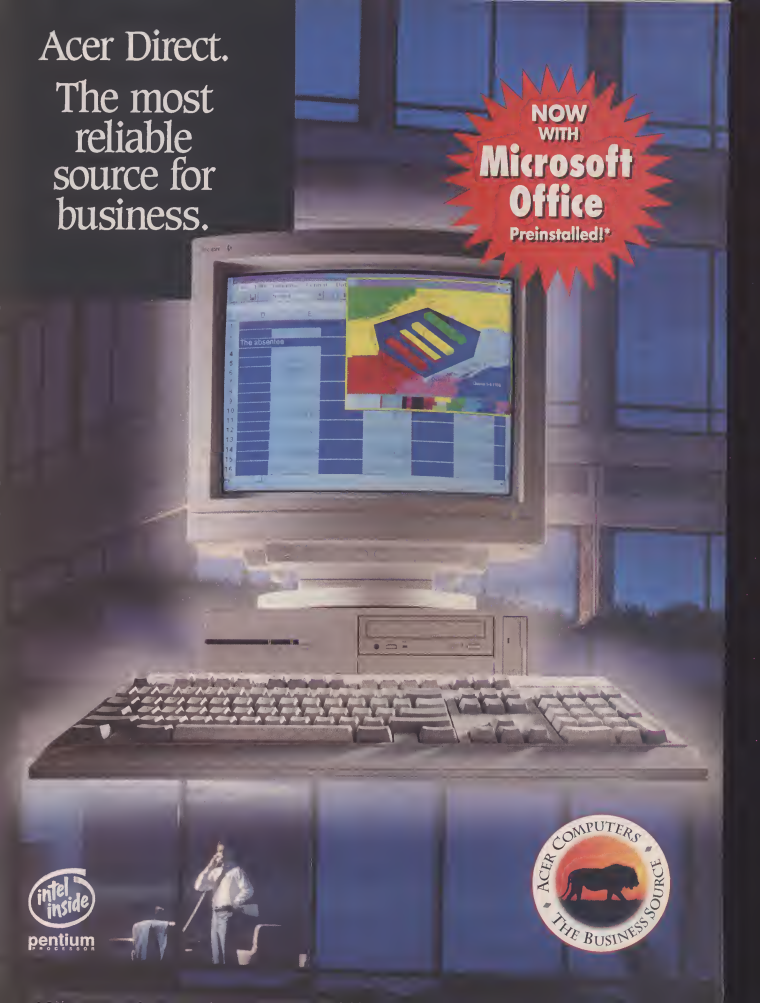
Edited by WENDY TAYLOR

PHOTOGRAPH BY ARNOLD TASELIO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- High-Speed I/O Ports
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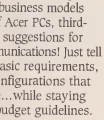

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Circle 146 on reader service card.

Bug Bytes Quick Fixes to Software Glitches and Hardware Gotchas by Doug Vargas

Epson's Stylus Color Prints Minimalist Art

Although color laser printing remains the sport of kings, peasants can crank out some decent-looking pages of their own with color ink-jet printers like Epson's Stylus Color. Unfortunately, Stylus Color owners may also encounter a few dragons along the way, such as crashes using Microsoft Word 6.0, difficulties printing from CorelDraw 5, or just blank pages.

Fix: Get the latest Stylus Color printer driver (Version 1.06e). It's available on Epson's BBS at (310) 782-4531 and CompuServe (GO CIS:EPSON, Library 6); look for STY106.EXE. Since it's half a megabyte in size, royal subjects should use their fastest carrier pigeons.

Stealth 64 Gets a Refresher When you call tech support about any product, they always say the same things: It must be that screen saver; it must be your video driver; do you really need the entire *Star Trek* theme song for your Windows startup sound? Of course, we know it can't be the screen saver or the audio, but the video driver is a different story. Users of Diamond Multimedia Systems' Stealth 64 VRAM graphics cards have had numerous problems, including difficulties doing PowerPoint presentations and corrupted menus in WinFax Pro 4.0.

Fix: Well, it could be the screen saver, or . . . hey, this time it really is the video driver, and Diamond has a new version that cures all these ills. The file is 968133.EXE, and you can download it from Diamond's support BBS at (408) 325-7175 or from PC Computing Online (see page 280).

A Checkup for Central Point's Backup What's the only thing more boring than backing up your hard drive? Verifying the backup—it's the icing on the cake of tedium. Good thing programs like Central Point's Backup 2.0 for Windows have an Auto Compare feature that handles this chore automatically. In some cases, however, Auto Compare crashes a system or dumps you to DOS.

Fix: Until a new version of Backup comes out, don't use the Auto Compare feature. Instead, after backing up your drive, exit Backup, relaunch it, and manually run Compare. Then make a run for it before you're bored to tears.

Word 6.0 Can't See Its Own Shadow It's nice that Microsoft created Word for Windows and Word for Macintosh so that these two groups of users could trade files instead of insults. Trouble is, if a Word 6.0 for Macintosh document contains graphics or OLE objects, Word 6.0/6.0a for Windows can't display them.

Fix: Just ignore the Mac-weenies! Ah, but we really do have to view their files, graphics and all. So the right thing to do is upgrade to the latest version of Word for Windows (Version 6.0c). Call Microsoft at (800) 426-9400 to order the update (it's not available online).

Excel Falls Asleep During Print Reruns Despite the similarities, your laser printer is not a copy machine. Sure, it will crank out a dozen copies of a report, but it could do without that kind of punishment. And if you're using Microsoft Excel 5.0/5.0c for Windows and try to print multiple copies of a workbook, there's something else you should know: The printer may stop with the job half finished . . . and with nary an error message.

Fix: The best solution? Honor thy laser printer. Print one workbook and photocopy the rest of them. If you wear out the copy machine in the process, well, it's better than smoking your output device. But if you insist on punishing your printer, quit Excel and restart to continue printing.

Word Needs Its Space Are you guilty of editing documents to death? Some users of Microsoft Word 6.0 for Windows are getting scolded for their constant whittling and reworking. When they attempt to move an object within a Word document, an error message states: "There are too many edits in the document. This operation will be incomplete."

Fix: It turns out this has nothing to do with overediting—the message really means: "You're running out of disk space on the drive where the Windows TEMP directory is; better zap some of those games." Make space for this directory, and the problem goes away. Of course, you'll have to install a larger drive so you can put the games back on.

Clean House for WordPerfect Does old software resent being replaced? Well, how would you feel if some young punk kicked you off the hard disk and took over your home? I think I'd leave the new guy a mess to clean up! Sure enough, some folks updating WordPerfect 6.0/6.0a for Windows to Version 6.1 have found that the new program runs sluggishly or crashes intermittently.

Fix: Don't install WordPerfect 6.1 over an earlier version. Instead, uninstall the old-timer first using the "uninstall" option in WordPerfect's Setup program. If you still encounter application errors, go into the \WINDOWS directory and rename WordPerfect's preference file (WPCSET.BIF) to WPCSET.OLD and relaunch WordPerfect. You'll lose all of your preferences, but WordPerfect 6.1 will finally be rid of the ghost of software past.

Good News: CorelDraw Gets an F Ever since Windows invaded the peaceful world of computing, a zillion graphics programs have sprouted up like dandelions. But the most deeply rooted Windows program is a PC original: CorelDraw. Unfortunately, the applications in the CorelDraw 5 suite (including PhotoPaint for image editing and Ventura for DTP) need a little weeding. CorelDraw users sometimes have trouble using high-resolution texture fills. PhotoPaint users have been niggled by its rulers and color correction. And the revamped Ventura has suffered from slow printing and OLE obstacles.

Fix: Corel addresses all these issues in the most recent update of the suite (Version 5, Revision F). Registered users can obtain the update by contacting Corel at (800) 772-6735.

Want More?

Get weekly bug updates and software fixes from our Web page or our CompuServe forum (see page 280 for details on how to log on). Got a bug to report? Drop Doug Vargas a line via the Internet at 72241.2367@compuserve.com.

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TCO Certified	YES	YES	YES
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The A-List

Editors' Top Picks by Wendy Taylor

		Top Pick	The Buzz	The Stats	Issue Reviewed
Systems	High-Performance Pentium	Dell Dimension XPS P133c	**Sets the new 133MHz speed limit—at a price you can afford.**	$3,549, 133MHz Pentium, 16MB RAM, 1GB hard drive.	See page 66. Reader Service No. 621
	Pricewise Desktop PC	AST Advantage Adventure	**Everything you need to run a business: voice mail, fax, and lots of apps.**	$2,399, 75MHz Pentium, 8MB RAM, 540MB hard drive.	See May 1995, page 67. Reader Service No. 622
Portables		Toshiba Satellite T2150CDT	**A built-in CD-ROM drive and a battery that lasts and lasts. Coming soon: a removable quad-speed CD-ROM drive.**	$4,899, 75MHz 486DX4, 8MB RAM, 500MB hard drive.	See April 1995, page 58 Reader Service No. 623
		IBM ThinkPad 701C	**It redefines portability. Watch the butterfly keyboard spread its wings as you open the case.**	$4,999, 50MHz 486DX2, 8MB RAM, 510MB hard drive.	See March 1995, page 56. Reader Service No. 624
		Dell Latitude XP4100CX	**Tough as nails, plus a battery that takes you from N.Y. to L.A.**	$2,200 to $4,199, 100MHz DX4, 8MB RAM.	See January 1995, page 124. Reader Service No. 625
Printers	Desktop Laser	HP LaserJet 5P	**It's compact and affordable, and it prints brilliantly. Dispense with cables and beam jobs to the IR port.**	$850, 6 ppm, 600 dpi, PCL5 (PostScript optional), infrared port.	See June 1995, page 64. Reader Service No. 626
	Network Laser	HP LaserJet 4Si MX	**Even 50-page print jobs fly out faster than you can trot down the hall to claim them.**	$5,200, 17 ppm, 600 dpi, PostScript, 1,000-sheet capacity.	See December 1994, page 134. Reader Service No. 627
	Portable Printer	Citizen PN60	**Small enough to slip into a briefcase, light enough to carry anywhere.**	$365, 300 dpi thermal transfer, 2.25 lbs.	See February 1995, page 64. Reader Service No. 628
	Personal Color Printer	Canon BJC-70	**If the sleek black design doesn't grab your attention, the color output will.**	$259, 720 by 360 dpi (mono), 360 by 360 dpi (color).	Stay tuned. Reader Service No 629
Video	High-Resolution Monitor	Nanao FlexScan T2-20	**It's like buying orchestra seats for Windows—and worth every penny.**	$1,249 (17 inch), $2,120 (20 inch), 1,280 by 1,024.	January 1995, page 88. Reader Service No. 630
	High-Resolution Graphics Accelerator	Matrox MGA Impression Lite	**The secret to ultra-fast Windows performance, 3-D graphics and all.**	$449, 4MB VRAM, 1,280 by 1024 at 76Hz, PCI interface.	See February 1995, Page 70. Reader Service 631
Storage	Removable Storage	Iomega Zip drive	**Zippety-zip. Near-hard-drive performance, and the cartridges are removable.**	$200, 25MB or 100MB cartridges, SCSI or parallel.	See June 1995, page 70. Reader Service No. 632
	CD-ROM Drive	Plextor 6Plex	**The fastest CD-ROM drive you can buy. Watch for other six-speed drives from NEC and Teac soon.**	$550, SCSI connector, 250ms access time, 256K buffer.	See June 1995, page 67. Reader Service No 633
Peripherals		Storm Software EasyPhoto Reader	**Digital photography for the rest of us. Scan snapshots and drop them into documents in seconds.**	$249, Windows 3.1, CD-ROM drive, serial-port scanner.	See May 1995, page 38. Reader Service No. 634
		Creative Labs Sound Blaster Awe32	**The gaming and business standard. Sounds great, too.**	$299, 32-voice polyphony, 16-bit DSP.	See June 1995, page 162. Reader Service No. 635
		Motorola V.3400	**Wires you to the world at 28.8Kbps—the compatibility champ.**	$895, 28.8Kbps, LCD readout.	See June 1995, page 166. Reader Service No. 636

The A-List Editors' Top Picks by Wendy Taylor

		Top Pick	The Buzz	The Stats	Issue Reviewed
Desktop Apps	Software Suite	WordPerfect PerfectOffice 3.0	**Integration so seamless you'll forget which application you're in so you can get right down to work.**	$659, 386, 8MB RAM, 40MB to 90MB hard-disk space.	See November 1994, page 85. Reader Service No. 637
	Word Processor	Microsoft Word 6.0	**Still the wordsmiths' favorite, but Ami Pro fans should check out the new Lotus Word Pro for Windows.**	$495, 386 or faster, 8MB RAM, 28MB to 32MB hard-disk space.	See December 1994, Page 160 Reader Service 638
	Spreadsheet	Microsoft Excel 5.0	**Quattro Pro and 1-2-3 also get the job done, but usability extras make Excel our top pick.**	$320, 386 or faster, 4MB RAM, 20MB hard-disk space.	See December 1994, page 168. Reader Service No. 639
	Database	Lotus Approach 3.0	**The easiest high-octane database to master—no programming required.**	$329, 386 or faster, 4MB RAM, 8.5MB hard-disk space.	See March 1995, page 146. Reader Service No. 640
Graphics	Presentation Graphics	Microsoft PowerPoint 4.0	**Create a winning sales presentation—on your lunch hour.**	$340, 386 or faster, 4MB RAM (8MB recommended).	See December 1994, page 178. Reader Service No. 641
	Personal Desktop Publisher	Microsoft Publisher 2.0	**Professional publishing results without the overhead.**	$89, 386 or faster, 4MB RAM, 3MB hard-disk space.	See page 170. Reader Service No. 642
	Professional Desktop Publisher	QuarkXPress 3.3 for Windows	**Industrial-strength layout with tight typography and color control. But watch for the new version of PageMaker.**	$570, 486 or faster, 8MB RAM, 12MB to 15MB hard-disk space.	See December 1994, page 163 Reader Service No 643
	Business Graphics	Shapeware Visio 3.0	**Drag, click, done. Business drawing for left-brainers.**	$149, 386 or faster, 4MB RAM.	See December 1994, page 205. Reader Service No. 644
	Photo Editor	Adobe Photoshop for Windows	**Craft digital masterpieces or paint a mustache on the queen. The image editing standard for Macs and PCs.**	$550, 4MB RAM, CD-ROM drive.	See November 1994, page 106. Reader Service No. 645
Finance	Personal Finance	Intuit Quicken 4 Deluxe	**Balances your checkbook so you don't have to.**	$39, 386 or faster, 4MB RAM, 7MB hard-disk space.	See April 1995, page 186. Reader Service No 646
	Business Accounting	Peachtree Accounting 3.0 for Windows	**Cheaper than your average accountant and a lot easier to understand.**	$139, 386 or faster, 4MB RAM, 12MB hard-disk space.	See October 1994, page 88 Reader Service No. 647
	Investment Planning	Intuit Quicken Financial Planner	**A boon for boomers; don't retire without it.**	$39, CD and floppy versions, 4MB RAM, Windows 3.1.	See June 1995, page 38. Reader Service No. 648
Communications	[illegible]	Delrina Communications Suite 2.1	**Total fax and modem control. Next up: a bundled page scanner for sending hard copy.**	$109, 486 or faster, 4MB RAM, 10.5MB hard-disk space.	See January 1994, page 126. Reader Service No 649
	[illegible]	Netscape Navigator	**Still the fastest way to cruise around cyberspace. Download a copy from ftp.mcom.com.**	Free ($39 for comm version), 4MB RAM, Internet access.	See April 1995, page 52. Reader Service No. 650
Organization Tools	Personal Information Manager	Lotus Organizer 2.0	**Sure the interface is precious, but the networking and usability extras are first-rate.**	$119, 386 or faster, 8MB hard-disk space, Windows 3.1.	See February 1995, page 118 Reader Service No. 651
	Reference	DDA PhoneDisc PowerFinder 95	**Let your fingers do the walking . . . search the phone books of the United States in seconds.**	$199, 386 or faster, 4MB RAM, CD-ROM drive, Windows 3.1.	See page 98. Reader Service No. 652
	System Utility	Ballard Synergy d-Time10	**Soup up your CD-ROM drive: Cache data to your hard drive and watch your discs fly.**	$55, CD-ROM drive, 15MB or more hard-disk space.	See May 1995, page 100. Reader Service No. 653

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Paul Somerson

WEB-LASH

Quick—what's the most dangerous threat to us all? Sarin-filled subways? Russian plutonium smugglers? Government bureaucrats? Cults arming against government bureaucrats? Disgruntled postal workers? Pat Robertson? **HOT MCDONALD'S TAKE-OUT COFFEE?** Guess again. Ask a growing number of boneheads out there and they'll tell you public enemy No. 1 is none other than the World Wide Web.

You can't turn on a TV or skim a newspaper these days without stumbling over hordes of shrill technophobes urging regulators to pull the plug and shut the whole Internet down.

Their new bogeyperson is the radical right wacko, now that online recipe-swapping sometimes involves ingredients like **FERTILIZER AND FUEL OIL**. The week after the tragedy in Oklahoma, trash TV was filled with wild-eyed discoveries that, yes, extremists use the Internet, too. There was even an erroneous flash on one tabloid news show that prime bombing suspect Timothy McVeigh had an America Online account—as if this by itself was a crime, or proof of something dark and evil.

Another bugbear is the Harassment and Victimization Brigade. These single-issue cranks see the online world simply as a vehicle for words and thoughts they don't agree with. They prowl the Net for strong language, unwelcome speech, **INAPPROPRIATE LAUGHTER**. Recently, Representative Kweisi Mfume even introduced an insanely broad "Electronic Anti-Stalking Act" that gives these losers a First Amendment–bashing club. Use that smiley-faced emoticon wrong, buster, and you're in big trouble.

And there are always the antisex freaks. Breathless TV accounts have convinced them that the entire Internet is essentially a vast network of digital deviants bent on ensnaring their young, and an endless unsolicited torrent of multimedia smut pulsating down the phone lines, a **PORNUCOPIA OF PERVERSION**.

While it's true that knowledgeable Web-crawlers can check out exotic newsgroups like *alt.binaries.nude.celebrities* (where you can see **"WILLARD SCOTT NEKKID"**), the average user won't have a clue about how to find, download, and view such material.

Now there's even a whole new book zapping the Net: *Silicon Snake Oil*, by Clifford Stoll. Better known for his *The Cuckoo's Egg* exploits, Stoll savages the Net as an **OVERHYPED, DEHUMANIZING WASTE OF TIME** for drones and asocial dorks. He complains it's an "ostrich hole" that diverts us from solving social problems and prevents us from planting tomatoes (I'm not making this up). He castigates schools for buying PCs instead of more books. For more than 200 rambling pages, he ticks off a long list of online benefits and then tries to punch holes in every single one. Frankly, his reasons are often a little, well . . . cuckoo.

Memo to all these whiners and troublemakers: Lighten up. And take advantage of the technology instead of trying to kill it.

PHOTOGRAPH BY JAMES McGOON

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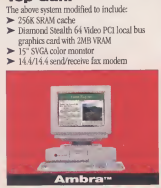

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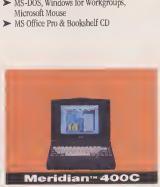

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John C. Dvorak

Just Say Nose

More screwiness as Windows 95 gets ready for the big launch. Now, at the eleventh hour, I'm hearing comments such as, "Plug and Play isn't going to be as perfect as expected." Or, "The memory model is basically flawed." And, "It's the same old cooperative multitasking for all practical purposes." But the zinger was from a friend who said, "I have it from deep within the Windows 95 programming group that the real product will not be ready until November. Period!"

It's possible that Microsoft will ship Windows 95 in August to prevent further humiliation. It's also possible that Microsoft will then quickly roll out a free upgrade called the Windows 96 patch to assuage any complaints and make the company look like a bunch of good guys. "Wow, they gave us a free bug fix!"

Since Microsoft has seeded the operating system everywhere, I've toyed with Windows 95 over the past few months in violation of my principles against dealing with beta code. Windows 95 is prettier and jazzier than plain old Windows 3.1, but probably not so much better that everyone must flock to it. The primary new change is the user interface, which resembles—indeed mocks—OS/2 and the Mac (sans garbage can). This amuses me, because Windows-promoting pundits like Ed Bott are waxing over how much better Windows 95 is than Windows 3.1. "All the flaws are fixed!" These were the same people who ranted about how great Windows 3.1 was after 3.0. "All the flaws are fixed!" It never ends.

The fact is, Windows 3.1 is just fine for 99 percent of the users. What does Windows 95 bring to the party? A user interface that has been around for over a decade? People who liked that interface already bought a Mac or switched to OS/2 years ago.

It's horrible how Microsoft leads users around by the nose. The last time I was in the Redmond area I saw a group of weirdos hanging out at Starbucks. They all had huge rings in their noses, except the main guy. He had a bone rather than a ring. If he caught you staring at him he'd jut out his neck and stare back at you intently. Then he'd grab either end of the bone with each hand, moving it back and forth in the large hole between his nostrils, screaming, "What are you looking at?" All the other guys would turn to you and begin to snort like pigs.

Anyway, it turned out that this was one of the Windows 95 beta users groups. They called themselves M1.COM and I believe they have a page on the World Wide Web. I got one of them aside to tell me about the group. Microsoft devotees, he called them. They are Seattle grunge types gone off the deep end. Each member had some sort of tattoo, as is popular in the Pacific Northwest, and many of them chose Microsoft themes. It was one of those times I really wanted my camera. The weirdest one was a caricature of Bill Gates sitting on a toilet, giving the "V" for victory sign. The guy wouldn't tell me what it signified.

Seattle **GRUNGE** *types in huge* **NOSE RINGS** *yelled* **'WINDOWS RULES!'** *with the sort of pumping* **SURFER HIPSTER** *action you see in* **MOVIES.** *Ready to march to Redmond!* **HUT!!**

So anyway, this was the day of their annual pilgrimage. About 35 people were at the coffee shop, and they ceremoniously passed a silver chain, each stringing it though their own nose ring to form one long human chain. Every year in May—on Cinco de Mayo, actually, in honor of their "Mexican Brothers"—they walk together from the site of the original Microsoft offices in Bellevue all the way to Redmond (for those who aren't familiar with the locale's geography, it's the next town over). It's a tribute to Microsoft and the corporate executives there "who have done more for America than Washington, Jefferson, and Lincoln combined."

The more I watched these guys, the more I wondered if they were escapees from a lunatic asylum in San Francisco. But I was told that they were sincere and that this has been going on for decades, or at least since Microsoft moved from Bellevue to Redmond. Anyway, when the last joker clamped onto the end of the chain, the entire group simultaneously yelled, "Windows Rules!" And then they all made fists and held them in front of their faces and pulled them down as if jerking the emergency cord of a train. It was the sort of pumping surfer hipster action you might see in the movies. This was followed by a collective "Yes!"

The guy with the bone in his nose then yelled, "Ready to march to Redmond! Ho! Ho! Hut!" and the group started walking out of the cafe.

I was making my way to Redmond later and I could see this procession of clowns just off the freeway. The guy with the bone in his nose was holding up a flag emblazoned with the Windows logo. They were chanting some hymn. As I drove by I saw them entering a secret tunnel that leads to the Microsoft offices. Later in the week, I learned the code name for the Windows 96 patch: "Nose ring!"

Welcome to the next level.

PHOTOGRAPH BY JAMES MADDON

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The Pantera, based on Intel's 486, DX4 and Pentium processors, leaps ahead of the pack with record-breaking performance and awesome power.

In a Pentium and 486 roundup, *PC Magazine* gave top honors to ZEOS Pantera: "Few product lines fared as well in our price/performance index as the ZEOS Pantera family....The Pentium machines produced first-place scores in their respective tiers, and the ZEOS 486DX2-66 earned a top-five ranking...."

What makes the Pantera the top performer? Superior engineering—starting with a ZEOS designed motherboard created specifically to take full advantage of the latest technological advancements. The motherboard is loaded with exceptional features such as PCI Local Bus expansion which delivers 32-bit data at a rate up to 132MB per second, an on-board PCI Local Bus Enhanced IDE Controller, and support for up to four IDE devices. EIDE hard drives are available to 1.2GB standard, upgradable to 4GB SCSI. For optimum EIDE hard drive performance, the Pantera even supports Programmed I/O Mode 4, which gives you the fastest data transfer rates possible.

And there's more...like a Diamond Stealth 64-bit PCI local bus video card *standard* for the ultimate video solution, and a 4X CD-ROM for increased data transfer rates.

The Pantera's performance is top ranked. In fact, *Windows Magazine* gave it their prestigious 1995 WIN 100 award. They said: "The Pantera 90 slashed through our benchmarks...ZEOS dobbers the competition."

Buy With Confidence

ZEOS is committed to providing you with an excellent value. With all the extras, options, and compatibility with all major operating systems—including Novell NetWare and OS/2—you can't go wrong with the award-winning ZEOS Pantera.

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With striking performance, unequaled reliability and definitive value, the ZEOS Pantera is the only system you should have. To get the *Fastest Cat* around, call your ZEOS Systems Consultant today at 800-554-5218.

PC MAGAZINE EDITORS' CHOICE — Pentium-66 April 12, 1994; DX4-100 June 28, 1994

COMPUTER SHOPPER — Pentium-60 April 1994; Pentium-60 August 1994

PC WORLD — 486DX2-66 January 1994, February 1994, March 1994, June 1994, September 1994, January 1995, February 1995, March 1995, April 1995; DX4-100 October 1994, November 1994, December 1994; Pentium-60 December 1994, January 1995, February 1995, April 1995

PC Best — Pentium-66 June 1994, July 1994, August 1994, September 1994; Pentium-90 August 1994, September 1994, October 1994, November 1994, January 1995, February 1995

Windows EXPERTS' PICK — Pentium-66 May 1994; Pentium-90 February 1995

Pentium-66 June 1994; Pentium-90 August 1994

Pentium-80 November 1994

WINDOWS 1699 WIN 100 — Pentium-90 May 1995

Package 1		Package 2		Package 3		Package 4	
486DX2-66	$1295	486DX2-66	CN! $1595	486DX2-66	CN! $2095	486DX2-66	$2495
DX4-100	$1445	DX4-100	$1745	DX4-100	CN! $2245	DX4-100	$2645
Pentium-60	$1545	Pentium-60	CN! $1845	Pentium-60	$2345	Pentium-60	$2745
Pentium-75	$1645	Pentium-75	CN! $1945	Pentium-75	CN! $2445	Pentium-75	$2845
Pentium-90	$1745	Pentium-90	$2045	Pentium-90	CN! $2545	Pentium-90	$2945
Pentium-100	$1895	Pentium-100	$2195	Pentium-100	$2695	Pentium-100	CN! $3095
Pentium-120	$2145	Pentium-120	$2445	Pentium-120	$2945	Pentium-120	CN! $3345
➤ 4MB RAM		➤ 8MB RAM		➤ 16MB RAM		➤ 24MB RAM	
➤ **528MB** local bus IDE hard drive, 14ms		➤ **850MB** local bus IDE hard drive, 11ms		➤ **1GB** local bus IDE hard drive, 12ms		➤ **1.2GB** local bus IDE hard drive, 10ms	
➤ 3.5" 1.44MB floppy disk drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive	
➤ **Diamond Stealth 64** PCI local bus color video card, 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus color video card, 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus color video card, 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus color video card, 1MB DRAM	
➤ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dp		➤ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dp		➤ **ZEOS 15"** 1024 x 768 NI SVGA color monitor, .28mm dp		➤ **ZEOS 15"** 1024 x 768 NI SVGA color monitor, .28mm dp	
➤ Six-bay desktop case with two cooling fans		➤ Six-bay desktop case with two cooling fans		➤ Six-bay desktop case with two cooling fans		➤ Six-bay desktop case with two cooling fans	
➤ Microsoft Mouse		➤ Microsoft Mouse		➤ Microsoft Mouse		➤ Microsoft Mouse	
➤ MS-DOS 6.2, Windows for Workgroups 3.11		➤ MS-DOS 6.2, Windows for Workgroups 3.11		➤ MS-DOS 6.2, Windows for Workgroups 3.11		➤ MS-DOS 6.2, Windows for Workgroups 3.11	
➤ **MS Works**		➤ **MS Works Multimedia CD**		➤ **MS Office Pro & Bookshelf CD**		➤ **MS Office Pro & Bookshelf CD**	

intel inside pentium processor

Included With Every ZEOS Pantera:

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- ➤ On-board Fast SCSI-2 option.

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Gil Schwartz

The Dead Zone

I have a secret hiding place where I go sometimes. It's a little room in my basement, down where the boiler hums and grumbles its way through the night. It's a relatively dark room, illuminated by the light of one hanging bulb, filled with the smell of old wood, burning oil, papers long ago filed and forgotten. A stack of vinyl records heaves over in one corner. And filling about half the room, over by the fuse box, is a large pile of dead friends who used to be important to me. I go there and sit sometimes. And I remember.

Today I'll add a new addition to their number. It's my first laptop, an NEC dual-floppy the size of an attaché case. I had it stowed beneath the TV for the longest time, until I suddenly realized I would never use it again. Poor dear has no hard drive. Best put it out of its misery.

How many expensive and formerly valued objects are here! Once they were precious. Now they're junk. That's true of a lot of things, I guess. The baseball glove or dolly you owned when you were a kid. The leather headband that made you look so cool (or possibly not) when you were a lean and frisky teenager. But in the world of computing, the life cycle seems as short as that of the mayfly, which springs to life for just a day and then winks out as if it never existed.

I'm setting the good, old NEC down next to the corpse of my old, beloved Kaypro, on which I wrote my first articles for money. Actually, it's not the whole machine—which died and went to a repair shop from which it never returned. It's the metal keyboard and cable. Thousands of words were slammed into this thing, and even a few ideas. Now what is it? Toast.

Here's my old Hewlett-Packard PaintJet. It seemed like a marvel when I first toted it home with its little ink cartridges and perforated tractor paper. It printed in color! It would still work, too, except that the interface on its rear is for a proprietary cable that I can't seem to locate. Also, I have come to hate tractor paper. How many times did I hit Print and leave to get a cup of coffee, returning to find that 1,200 words had been laid down on top of each other, over and over on the same line, because the feed had gone screwy?

Shouldn't there be a second life for such an object? A life beyond my basement?

Next to the PaintJet is an enormous Juki daisy-wheel printer. The daisy wheel is in a specific typeface, Elite or Courier, like the old IBM Selectric type balls used to be. When it printed, the wheel would fly back and forth and make the most outrageous racket. It's quiet now. Dead quiet.

So is the little white box that holds the inert guts of my old Acer MultiTech 500, which sported a mini-motherboard that did not comfortably receive third-party add-in cards. I wanted to expand. It wouldn't. I suppose I could plug it in again and it would still work fine. Give it to my dog, just to play around with. But all it takes are low-density floppies. And what good are those these days?

They're the **LIVING DEAD** *that haunt me—and my basement: A* **DISEMBODIED** *old Kaypro, mossy WordStar disks, a* **CREAKY** *tractor-feed printer. It's time for them to rust in peace.*

In fact, here's a half-full box of the little suckers right here. Why didn't I pitch them out? Because they still work. In some parallel universe, I'll bet there are people who might find them useful. Just not in this one, that's all.

And boards! Boards and cards I used to love. Hi there, little I/O card! I remember when I brought you home! Unfortunately, you conflicted with some interrupt or other. You were only $49. It seemed easier to put you aside. Two old Sound Blaster cards, each supplanted by upgrades . . . . A couple of used VGA boards . . . . A Wile E. Coyote mouse pad . . . .

And cascading around my feet are the husks of software long superseded by later developments. Stuff that would work, you know, if there were machines to run it on, printers that embraced the formats, people who still used those machines.

Look! A box, covered with moss and rime, full of of OS/2 Version 1. The darn thing hasn't hardly been opened. The diskettes are still sealed in shrink-wrap. All that seems to be slightly used is the section of the manual pertaining to installation procedures. Oh yes, now I remember. Waking up at 3 o'clock in the morning, screaming, after reading that section . . . .

Choke, sob . . . WordStar!

And more! Games on disks too large to fit into any of my current computers. CD-ROMs that no longer interest me. The Grolier Encyclopedia, replaced by Microsoft Encarta. Wolfenstein 3-D, replaced by Doom, supplanted by Rise of the Triad, which itself will soon give way to Heretic, and kids' games long since played and won. A 14-inch black and white screen.

Couldn't this all be doing somebody some good? What a waste.

Would any of you like this stuff? Would you know what to do with it? I'd love to donate it to your collection. You're welcome to it. Let me know. It seems only fair to put it to good use.

And a good deduction is hard to find.

PHOTOGRAPH BY JAMES McGOON

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New! Lotus Word Pro for Windows

Ami Pro Returns as a Word Pro

SNEAK PREVIEW

It's tough to send your best worker on sabbatical. But in a perfect world, he or she returns refreshed and full of new ideas. In the three years since Ami Pro's last release, this darling of the word processing world has sat back, taken notes, and recently reappeared with a new name and a new way of working. Lotus Word Pro for Windows offers stunning workgroup computing features and a creative way to tackle the most mundane word processing chores.

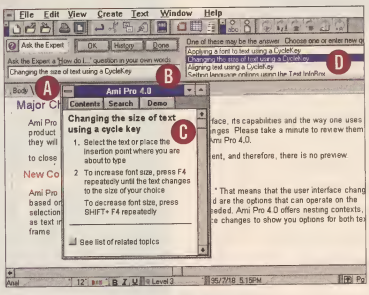
The best thing about Word Pro is that it's not just a copycat of Microsoft Word 6.0 or WordPerfect 6.1. Sure, it adds some of the necessary me-too features, such as SmartCorrect for cleaning up typos as you go and SmartEditing selection that highlights an entire word even if your mouse doesn't. The program also has something called Format Check that loosely corresponds to Word's AutoFormat, though Format Check is not nearly as powerful.

Document Tracking But Word Pro breaks new ground, especially when it comes to version control. Tired of saving your files with different names and extensions to reflect which version is which? Relax. With Word Pro you can save multiple versions of a document in a single file. And you can make comments on each revision so you don't have to worry about creating an electronic paper trail.

Word Pro also has some impressive workgroup features, such as TeamReview for powerful and easy-to-use revision marking. Just tell Word Pro's Assistant who you want to review the document, what level of editing control they will have, and how the document will be distributed—whether by e-mail routing or by saving the document to a particular file. After each person on your list makes comments (in designated colors, if you like), you have an easy way to review, accept, or reject the comments.

Unique and Powerful Some simple usability extras set Word Pro apart from the word processing pack. The first thing you're likely to notice is the InfoBox. If you've ever used Lotus Improv, the InfoBox will look familiar. Further refined in Lotus Approach, it's the only place you need to turn for fine-tuning all of your properties, from fonts and bullets to alignment. There are also variations of the InfoBox for manipulating properties of frames, tables,

OVERVIEW Word Pro's New Way of Word Processing



A. You've seen them in spreadsheets; now Word Pro's **document tabs** give you quick access and an easy way to organize long documents.

B. Need help? **Ask the Expert** is standing by, ready to take your toughest word processing questions.

C. Detailed **online help** pops up after you choose a topic. You can even access an online demo to see exactly how to accomplish your task.

D. After you ask the expert, you'll see a choice of **help topics.** Double-click on the topic that best suits the task at hand.

Master of Words: Lotus Word Pro for Windows, the long-awaited upgrade to Ami Pro for Windows, has finally arrived. Lotus is shipping the 16-bit version first, and a feature-compatible 32-bit Windows 95 version will ship when the Microsoft operating system does.

PICKS WINDOWS **WORD PROCESSORS**

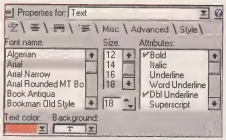
Advanced workgroup and version features	Lotus Word Pro for Windows
Still the usability champ	Microsoft Word 6.0
Strong cross-application integration	Novell WordPerfect 6.1

Pick Your Typist: Word Pro takes a stand, but Word 6.0 and WordPerfect 6.1 are still tough competitors.

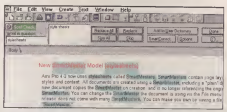
Guide to PC Computing's Ratings

Excellent *A market leader that offers exceptional performance* ..... ★★★★★
Good *Excels in many areas; a good buy* ..... ★★★★
Acceptable *Average for its class; a justifiable purchase* ..... ★★★
Poor *Out-of-date or substandard, offset by some positive features* ..... ★★
Unacceptable *Missing necessary features; avoid* ..... ★

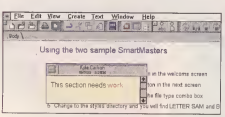
GUIDED TOUR LOTUS WORD PRO BREAKS NEW GROUND



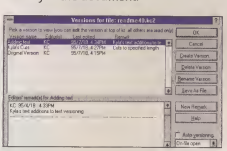
One-Stop Shopping: A simple click brings up Word Pro's InfoBox, which enables you to manipulate all necessary attributes from one dialog box.



Word Check: In one view Word Pro lets you see all of the misspelled and unrecognized words in your document. Step through highlighted sections word by word, or zoom in and make edits directly in the document.



Make It Stick: You and your coworkers can easily add color-coded comments to a document via electronic Post-it notes. These notes are quick, easy to use, and support rich-text formatting. At a glance you can tell who made which comments. You can also minimize the notes so that they're available but not in your way.



Total Version Control: Tired of keeping several versions of a document in its various editing stages? Save multiple revisions (and comments about each round of revisions) in just one file with Word Pro's easy-to-use Versions feature.

FILEBOX

Lotus Word Pro for Windows

Usability ★★★★½
Technology ★★★★½
Verdict ★★★★½
Pushes the envelope for word processing.

Competition: Microsoft Word 6.0 for Windows and WordPerfect 6.1 for Windows offer similar basic feature sets, but their workgroup, versioning, and online help aren't as strong.

System Requirements: 33MHz 386, 6MB of RAM, 33MB of hard-disk space, Windows 3.1.

New Features: Version control, improved revision marking, easy-to-use spelling checker, natural-language online help.

Stay Tuned: A Windows 95 version of Word Pro that matches the Windows 3.1 version feature for feature will be released soon after the new OS ships.

$105 est. street price
Lotus Development Corp.
(800) 831-9679
Reader Service No. 661

and a number of other features.

Another enhancement to Word Pro comes courtesy of Freelance Graphics. In the spirit of that program's SmartMasters (which prompt you to "Click here to enter a title," for example), there is an assortment of SmartMasters in Word Pro that make document creation a snap.

Speel Check Ever notice how complacent we've grown with the implementation of everyday features in our word processors? Take spelling, for example. Time and time again we tell our spelling checker to ignore (or add to the dictionary) proper names, specific codes, filenames, and the like. With Word Pro, Lotus has taken this to a different level.

When you check a document, rather than stepping through each word that's not in its dictionary, Word Pro highlights all of the words in question so you can easily rule out proper names and other unusual cases. The program will then make suggestions for the remaining words, and like Word and WordPerfect, Word Pro lets you add new words to SmartCorrect. Word Pro's spelling checker even remembers where you are, so if you decide to jump into your document for some quick editing, you don't have to start the spelling check all over again.

A Helping Hand Word Pro also sets a standard with its Ask the Expert help feature, which lets you type your questions in plain English. Enter the query "How do I format a paragraph," for example, and Word Pro pulls up a series of help explanations. Of course the "expert" isn't perfect, but it's a good start.

Concerned about being left out in the cold when Windows 95 ships? Don't be. Look for a Window 95 release of Word Pro packed with a similar feature set shortly after Windows 95 ships. Feature for feature, Word Pro is generally on par with Word 6.0 and WordPerfect 6.1. But it has some innovative touches that put it on a different plane. Even if you're loath to switch word processors, you owe it to yourself to give Word Pro a look.

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Market Share Windows Illustration Software

PC Data, December Sales, 1994

CorelDRAW
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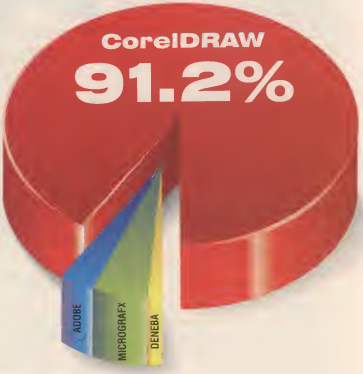
Company	Units	Sales
Corel	7,609	1,586,519.83
Adobe	257	73,968.64
Micrografx	380	36,696.38
Deneba	98	15,899.24
Totals	8,344	1,713,083.90



The results are in!

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#1

Corel VENTURA*
NUMBER ONE in PUBLISHING

Product	S.L.P. (US$)	Score
Corel VENTURA 5	$595	6.8
QuarkXPress	$895	6.7
Aldus PageMaker	$895	6.2

3.5" disk version

INFOWORLD
Report Card Rating,
Desktop Publishing Software
March 20, 1995

#1

Corel PHOTO-PAINT*
NUMBER ONE in IMAGE-EDITING

Product	S.L.P. (US$)	Overall weighted score
Corel PHOTO-PAINT 5 Plus	$249	44
Micrografx Picture Publisher 5.0	$595	42
Adobe Photoshop 3.0	$895	39
Fractal Design Painter 3	$499	38

3.5" disk version

PC World,
Best Buy Award,
April, 1995

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Document #1071

Circle 235 on reader service card.

New! HARDWARE: Dimension XPS P133c · Panasonic KXL-D720 CD-ROM Drive vs. CD-ROM Discman PRD150 · Panasonic V41 vs. Tadpole P1000 · SuperScript Color 3000

Brother MFC-4500ML, OfficeJet LX, Xerox 3002

Multifunction Miracle Machines

You can't play baseball without the basics: a bat, a ball, and a glove (bases help, too). The same is true for your office. Besides a PC, certain tools are essential: a phone, a fax machine, a printer, and a copier. In the past, this meant a jumble of nonintegrated, proprietary devices—assuming your budget could afford them all. But with the advent of the multifunction device (MFD), you'll never have to do without again.

We examined three of the most promising MFDs around: the Brother MFC-4500ML, Hewlett-Packard's OfficeJet LX, and the Xerox 3002. Each of these systems performs five essential functions: printing, scanning, copying, faxing from your desktop PC, and faxing from the MFD itself. The results? For a street price of $999, the Brother MFC-4500ML gives you laser output, fast speeds, and great software. But each of the three units we tested has something for everyone.

The Many Faces of MFDs: Multifunction devices like HP's OfficeJet LX (left), the Brother MFC-4500ML (center), and the Xerox 3002 (right) combine essential office functions like printing, copying, scanning, and faxing into smartly integrated space-saving units. Cover all your business bases at once for as low as $799, and free up valuable desk space.

PICKS ALL-IN-ONE **OFFICE** MACHINES

Fast, high-quality prints and user-friendly software	Brother MFC-4500ML
Easy-to-use power in an inexpensive ink jet	HP OfficeJet LX
Multiple copying functions and OCR software	Xerox 3002

Brother's Small Wonder

The Brother MFC-4500ML packs a wealth of features into the smallest footprint of the three devices. Its best feature is a 6-ppm, 300-dpi laser printer, which means that you have to make absolutely no sacrifices where output quality and speed are concerned. The Brother MFC-4500ML is also the only device of its kind to ship with a built-in telephone handset. In other words, you get an extra phone in the bargain.

Instead of bundling a third-party communications package, Brother ships the unit with its own easy-to-use software, Missing Link. It lets you connect the Brother MFC-4500ML to your PC for use as a fax modem, 200-by-300-dpi scanner, and 300-dpi printer. Of course, you can use another fax application, but Missing Link acts as your cockpit to all functions, and its interface and functionality are straightforward and complete.

The Brother MFC-4500ML is fast, quiet, and efficient for printing and faxing. And unlike the OfficeJet LX and the Xerox 3002, its pages emerge in the output tray face-down in order so you can just staple and go. The other devices require you

FILEBOX

Brother MFC-4500ML

Usability	****½
Performance	****½
Technology	****½
Verdict	****½

It's fast, it's laser, and it's under a grand.

Features (as tested): 9,600-bps fax modem, 6-ppm 300-dpi laser printer, 200-by-400–dpi scanner, 30-page automatic document feeder, 64-shade grayscale, 124-number fax memory.

$999 est. street price
Brother Int'l Corp.
(800) 284-4357
Reader Service No. 662

OfficeJet LX

Usability	****½
Performance	****
Technology	****
Verdict	****

A proven track record; inexpensive and user-friendly.

Features (as tested): 9,600-bps fax modem, 3-ppm 600-by-300–dpi ink-jet printer, 20-page automatic document feeder, 60-number fax memory.

$799 est. street price ($119 upgrade from OfficeJet)
Hewlett-Packard
(800) 474-6836
Reader Service No. 663

Xerox 3002

Usability	**
Performance	**½
Technology	***
Verdict	***

Disappointing software and printing; the best copier.

Features (as tested): 14.4Kbps fax modem, 3-ppm 300-dpi ink-jet printer, 15-page automatic document feeder, 100-number fax memory.

$999 est. street price
Xerox Corp.
(800) 334-6200
Reader Service No. 664

Guide to the Ratings: *****Excellent ****Good ***Acceptable **Poor *Unacceptable

PHOTOGRAPH BY ARNOLD TOSELLO

to manually reorder their pages, which can be tedious for long faxes or print jobs.

Second Time's a Charm Of the three systems we tested, the OfficeJet LX is the only one that's a second-generation MFD (see "HP Turns a Business Triple Play," December 1994, page 83). HP improved on many of the original OfficeJet's shortcomings, with the most significant boost being the inclusion of a 9,600-bps fax modem on the newer model.

The OfficeJet LX includes Phoenix Technologies' Eclipse Fax SE, which contains some handy and usable features. HP worked with Phoenix to customize Eclipse for the OfficeJet LX. In fact, it may be the only fax software you'll need, though you can always upgrade to another package.

We were also impressed with the OfficeJet LX Manager software. It lets you configure and manage your unit from a graphical, user-friendly interface rather than the front panel. Onscreen prompts walk you through customizations such as setting up fax headings with names, fax numbers, and dates.

The OfficeJet LX's output is 600-by-300-dpi ink jet, which does a good job on printouts and faxes. While the slightly fuzzy text shows ink-jet technology's faults, the OfficeJet LX should suffice for most printing situations. When you need dazzling output, use glossy or coated paper for near-laser results. You'll have to wait a little longer, but it should be worth it. Like the others, the OfficeJet LX can be used as a convenience copier. This is great for a few quick copies, but for larger jobs you're better off visiting the local copy center.

Generation Xerox From the land of copy machines emerge three combo devices: the Xerox 3002, 3004, and 3006 multifunction fax systems. We tested the Xerox 3002, the low-end model. The other models offer souped-up faxing speeds, more number storage options, and higher price tags, but with all of them Xerox bundles Delrina's WinFax Lite, a pared-down version of the king of fax software, WinFax Pro. The Xerox 3002 is the only MFD we tested that comes with WinFax Lite, which is a far more complete solution than what Brother and HP offer.

However, Xerox's dedicated configuration and management software is the least impressive of the group. We found its configuration dialog boxes complicated and anything but friendly. Another annoyance was that there's no coated-paper option in the print drivers. This means no additional drying time for special papers, which results in a smeary mess.

It should come as no surprise that Xerox's MFD has the most copying options. For example, it reduces and enlarges documents from 50 percent to 200 percent in 1 percent increments. In addition, the Xerox family of MFDs is the only one that provides an OCR software option. Xerox TextBridge (a standard offering with the Xerox 3004) is a powerful tool if you ever need to convert faxes or scanned document to electronic files. OCR would be a smart addition to the other MFDs, but for now the Xerox 3002 leads the pack.

Office Power There's no question that at a street price of $999, the Brother MFC-4500ML has the best bang for the buck with its laser output, fast speeds, and great software. The Xerox 3002 sells for the same amount, but its only benefits are the WinFax Lite software and more copying options than its competitors. Its speeds, usability, and feature set could use some enhancing.

For tighter budgets, the OfficeJet LX comes in at $799. Your only sacrifices in choosing it over the Brother MFC-4500ML are in output quality and speed. If you can tolerate the ink-jet technology, your pocketbook might steer you toward the OfficeJet LX. But you'll want to keep your eyes open for Lexmark's soon-to-be released Medley, a $900 MFD that includes a color ink jet.

KYLA K. CARLSON AND RICH SCHWERIN

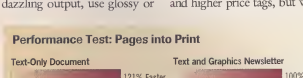
GUIDED TOUR PLAIN-PAPER OUTPUT TELLS THE STORY

Crisp and Clear: The output from the Brother MFC-4500ML is top-notch laser. Text and graphics are smooth and pleasing to the eye, and you don't have to worry about special paper. This unit is a perfect candidate for everyday printing.

Slightly Fuzzy: Unless you need the high-quality output of a laser printer, the OfficeJet LX should serve you nicely. Plain-paper output shows its ink-jet origins with some fuzz around the text, but better papers yield output that's finer.

Blurred and Indistinct: The Xerox 3002 forces you to do all of your printing on plain paper. Unfortunately, its output leaves a lot to be desired. The images bleed into the page, making small text or complex graphics almost indecipherable.

Performance Test: Pages into Print



NOTE TEXT-ONLY DOCUMENT IS 11-PAGE WORD 6.0 FOR WINDOWS FILE; NEWSLETTER IS 4-PAGE QUARKXPRESS 3.31 FOR WINDOWS FILE ALL TESTS ARE RUN UNDER WINDOWS FOR WORKGROUPS 3.11

Lightning Comes out Ahead: The Brother MFC-4500ML is the all-in-one device to beat. Its laser technology prints at speeds that are at least 100 percent faster than its competitors.

"What I need is a pint-size notebook with a full-size keyboard."

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IBM

Dell's 133MHz Pentium Scorcher

SNEAK PREVIEW

"Stand back," said the grinning lab technician as he hit the Enter key and sent the fastest x86 PC on a shockingly short ride through *PC Computing*'s application benchmark tests.

The sight was impressive. Dell's Dimension XPS P133c is the first 133MHz Pentium PC we've tested. Hitting 133MHz is no small feat either, given that fewer than half a dozen 120MHz Pentium systems have made it to market as of this writing. The Dimension XPS P133c leapfrogs the pack.

Complementing the barn-burning CPU performance is Number Nine's 9FX Motion video accelerator running on PCI local bus with 2MB of VRAM and 1GB of storage. The result is a spectacular platform for virtually any kind of graphics work, especially animation, video, and CAD. And of course, the Dimension XPS P133c won't shirk from financial modeling or queries across massive databases.

Showstopper Throughput is helped by a 512K L-2 CPU cache in addition to the Number Nine video adapter. Our test system came with 16MB of extended data out (EDO) RAM, expandable to 64MB. The result? Windows 95 never had it so good.

Yes, the Dimension XPS P133c is the fastest x86 PC we've tested to date. It nudged ahead of other 120MHz Pentium offerings, and bested its little brother, the Dimension XPS P120c, by 9 percent. To put that in context: Dell's 133MHz-based system runs Windows applications about six times faster than a 33MHz 486 Compaq Deskpro 433i.

Despite the hodgepodge of video accelerators, L-2 CPU caches, and hard drives that affect performance in 120MHz Pentium systems, the Dimension XPS P133c's speed advantage was surprisingly consistent. Its straight disk performance was utterly astounding, thanks to Quantum's 1GB IDE hard drive. It's faster than any IDE drive to spin through our labs.

Room and Zoom The Dimension XPS P133c's mini-tower houses an NEC quad-speed CD-ROM drive that's connected to an IDE host rather than the customary SCSI adapter. The system we tested also included a Sound Blaster AWE32 sound card with a wavetable option. Add to these CD-ROM and sound capabilities a top-deck pair of speakers (Dell offers several types), and you wind up with a superb platform for business presentations.

Our test system came with a 15-inch monitor that we liked for its bright, crisp images. But given the Dimension XPS P133c's underlying graphics power and relative low price ($3,599), the $350 extra for the optional 17-inch monitor is highly recommended.

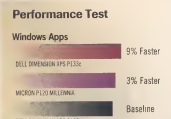
Instead of integrating sound and video onto the motherboard as Dell has done in previous systems, the Dimension XPS P133c includes these extras on add-in cards, which means that you sacrifice two of the machine's eight expansion slots (four PCI and four ISA). However, this also means that you can order the newer PC with any of Dell's video or audio options without paying extra for the privilege.

The Dimension XPS P133c comes with five drive bays (three free), which is the same configuration as the Dimension XPS P120c. This is ample room for expansion given that you're starting with 1GB of storage space. In addition, both machines are quiet enough for any office setting.

The $3,049 Dimension XPS P120c that we tested featured a 1.62GB hard drive as well as Number Nine's top-of-the-line Imagine 128 Pro video card and 4MB of VRAM. But its Sound Blaster 16 audio card lacked a wavetable option, and its performance trails its big brother by 9 percent. If horsepower is what you need, the 133MHz Dimension XPS P133c is only $500 more. **MARTY JEROME**

Power Station: The first 133MHz Pentium to hit our test bench, Dell's Dimension XPS P133c comes in the same handsome tower as its little brother, the Dimension XPS P120c. Both machines feature 1GB or more of IDE storage and quad-speed CD-ROM drives.

Leading the Pack: Overall, the Dimension XPS P133c performs 9 percent faster than its younger brother, the 120MHz Pentium-based Dimension XPS P120c, and 6 percent faster than Micron's P120 Millennia.



NOTE: WINSTONE 95 IS A BENCHMARK THAT RUNS 13 OF THE MOST POPULAR WINDOWS BUSINESS APPLICATIONS.

FILEBOX

Dimension XPS P133c

Usability	****
Performance	*****
Technology	****½
Verdict	****½

When you need all the muscle you can get, it's a winner.

Competition: The Dimension XPS P133c currently stands alone in its category, but look for offerings from the usual suspects before fall.

Features (as tested): 16MB of EDO RAM, 1GB IDE hard drive, quad-speed CD-ROM drive, 15-inch monitor.

$3,549 est. street price
Dell Computer
(800) 613-3355
Reader Service No. 665

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

PHOTOGRAPH BY ARNOLD HOSKEAD

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CD-ROM Drives That Travel

Welcome to a much-needed new era in portability for CD-ROM drives: dual-speed PC Card drives. These next-generation peripherals combine elements of portable audio-CD players with current behemoth CD-ROM drives that connect to parallel ports and stretch both multimedia PC (MPC) standards and the very concept of portability. Our two contenders come from industry giants: the Panasonic KXL-D720 PCMCIA Portable CD-ROM Drive and Sony's CD-ROM Discman PRD150.

Ties to the Past Both drives hook up to a notebook's PC Card slot and reveal the genes of their audio ancestors: They play audio CDs as well as CD-ROMs (the CD-ROM Discman even comes with headphones). They're black and sleek. They're smaller than a Stephen King novel. And they weigh less than a pound each—14 ounces for the Panasonic KXL-D720 and 10 ounces for the CD-ROM Discman.

Helpful controls and LCD readouts let you spin audio discs without resorting to Windows' Media Player. The fact that both drives can run off batteries further betrays their origins. Six AA batteries power the Panasonic KXL-D720 for about two hours, while two AA batteries give the CD-ROM Discman about an hour and a half of life. And both save battery life by shutting down their motors when not in use.

What really distinguishes these units from other CD-ROM drives is that they connect to a portable via a PC Card slot. This is a vast improvement over the older parallel-port connections, which were slow—often not even equal to the minimum MPC 1 or MPC 2 standards. Benchmark tests that compared seek times and data transfer rates to MPC requirements showed that both of these drives hit the MPC 2 standards. Even running off batteries, performance was decent.

Dock It While the drives exploit the PC Card slot, their methods of connection differ. The Panasonic KXL-D720 has a standard high-density SCSI-2 connector, and the CD-ROM Discman uses a proprietary connector that comes with the drive. This means that with the right cabling the Panasonic KXL-D720 can be attached to any notebook or desktop that has a SCSI outlet that's compatible with Advanced SCSI Programming Interface (ASPI). Similarly, any SCSI device can be attached to the PC Card that comes with the Panasonic drive. The CD-ROM Discman is limited to Sony devices.

Both of these drives are nice improvements over parallel-port CD-ROM drives in performance and portability. But they're not as convenient as the dual-speed drives built in to the latest (and pricey) multimedia notebooks. Also, neither drive provides the sound necessary to reach the full multimedia potential of CD-ROM.

Until new versions appear, the better choice is the Panasonic KXL-D720. It's not as small or sleek as the CD-ROM Discman, but it's $100 cheaper and its SCSI connector makes it more versatile. Maybe you can look at one of these as a temporary solution: When you finally get a notebook with a built-in CD-ROM drive, hand your old drive off to a teenybopper who wants it only to play Pearl Jam. After a few years, these drives will be mere curiosities. RON WHITE

Multimedia Minis: They're black. They're sleek. They play audio CDs and CD-ROMs. And they're more portable than ever. But Sony's CD-ROM Discman (left) and the Panasonic KXL-D720 (right) both employ quickly aging dual-speed technology.

PICKS PORTABLE **CD-ROM** DRIVES

Plug it in with ease via a PC Card slot or SCSI port	Panasonic KXL-D720
Small, sleek and it's a Sony	Sony CD-ROM Discman

Road Spin: The Panasonic KXL-D720 costs about $100 less than the CD-ROM Discman and offers two ways of connecting to a notebook.

FILEBOX

Panasonic KXL-D720 Portable CD-ROM Drive

Usability	★★★★★
Performance	★★★
Technology	★★★★
Verdict	★★★★

A great price for CD-ROM portability today.

System Requirements: PC Card slot or SCSI port.

Features (as tested): LCD readout, SCSI-2 connector.

$300 est. street price
Panasonic Communications
(800) 742-8086, (201) 392-4500
Reader Service No. 666

CD-ROM Discman PRD150

Usability	★★★
Performance	★★★
Technology	★★
Verdict	★★★

Only its smaller size recommends it over the cheaper Panasonic KXL-D720.

System Requirements: PC Card slot.

Features (as tested): LCD readout, headphones, proprietary connector.

$400 est. street price
Sony Electronics
(800) 766-9236, (201) 930-1000
Reader Service No. 667

PHOTOGRAPH BY ARNOLD NEWMAN

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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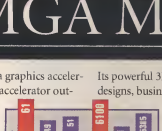

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*Estimated street/Estimated selling price for the 2 MB version. Windows and DOS tests conducted by Matrox Graphics Inc. using ZiffDavis' Winbench 4.0 and PC Bench 9.0 on an intel Triton PCI/EISA system (256 cache, 8 MB EDO RAM, Windows for Workgroups 3.11 at 1024 x 768 in 256 colors, 72 Hz, large fonts). MGA Millennium, Stealth 64, and Graphics Pro Turbo were configured with 2 MB of memory for the PCI bus using driver releases 1.00.20, 1.3 and 1.3 respectively.

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Two Pentiums Take to the Road

Not that we're keeping score or anything, but Panasonic and Tadpole Technology now offer two more reasons to deposit your desktop system in a dusty corner of the mail room and use a portable as your only PC: the Panasonic V41 and the Tadpole P1000.

The Panasonic V41, one of the first full-fledged multimedia notebooks to hit the streets, now features a 75MHz Pentium CPU. Combine this with a full-sized dual-speed CD-ROM drive, a 16-bit Sound Blaster–compatible audio chip, decent built-in stereo speakers, and a 10.4-inch active-matrix color display, and what do you get? A near-perfect platform for on-the-road business presentations or for running any multimedia application you use on your desktop system.

Swap 'Em The Panasonic V41 doesn't run out of gas quickly thanks to an auxiliary battery that swaps out with the floppy drive (by the way, you can even hot-swap them). The standard 648MB hard drive is also removable.

As expected, performance on the Panasonic V41 is exhilarating. It nosed ahead of NEC's 75MHz Versa P and ran nearly twice as fast as a standard 66MHz 486 notebook in Windows applications. No doubt its power was helped by a 256K L-2 cache and Chips & Technologies' 65545 video accelerator running on local bus.

The price you pay for this power and functionality is in heft—total traveling weight on the Panasonic V41 is more than 10 pounds. Also, the AC adapter is unreasonably large.

Of course, not everyone travels with CD-ROMs. The Tadpole P1000, which grew out of Tadpole's line of RISC portables, is the company's first x86 machine. It's also the first 100MHz Pentium notebook we've seen. Another inheritance from its RISC legacy: an 810MB removable SCSI-2 hard drive. Combine the fast CPU with the data transfer rates of SCSI-2, and you get a top-deck solution for transaction-heavy computing.

Fast, Fast, Fast The Tadpole P1000 was 46 percent faster than NEC's Versa P in our tests and more than 37 percent faster than the Panasonic V41. Databases, spreadsheets, and workgroup applications have never had it so good.

While the Tadpole P1000 lacks a CD-ROM drive—and a floppy drive, for that matter (it's external)—it features 16-bit stereo sound, a decent speaker, and a built-in microphone. Like the Panasonic V41, it ships with a 10.4-inch thin film transistor (TFT) color display.

The Tadpole P1000 is a powerful, feature-rich machine. Two usability highlights are the keyboard, which is nearly identical in layout and spacing to IBM's excellent ThinkPad, and the AC adapter, which is only slightly larger than a deck of cards. Two lowlights: The machine is large—8.5 by 11.8 by 2 inches—and its battery life of 1 hour and 24 minutes is barely enough for a flight from Los Angeles to San Francisco.

Never mind. The Tadpole P1000 is one of the most powerful Windows portables that money can buy. This alone makes it worth a look. But if you require multimedia power and Pentium performance, the Panasonic V41 may be your machine. MARTY JEROME

Portable Pentiums: The Tadpole P1000 (left) and the Panasonic V41 (right) blazed through our tests at lightening speeds. The Tadpole P1000 is the first 100MHz Pentium portable. Tap the trigger on the Panasonic V41, and the keyboard reveals a CD-ROM.

Performance Test: Pentium Power

NOTE: WINSTONE 95 IS A BENCHMARK THAT RUNS 13 OF THE MOST POPULAR WINDOWS BUSINESS APPLICATIONS. ZIFF-DAVIS BATTERY TEST ELECTRONICALLY SIMULATES COMMON USER ACTIVITY

Fast and Hungry: The Tadpole P1000 has the speed edge, but swapping the floppy for a second battery gives the Panasonic V41 over four hours of battery life.

FILEBOX

Panasonic V41

Usability ****
Performance ****½
Technology ****
Verdict ****
Multimedia power backed by a Pentium processor.

Features (as tested): 75MHz Pentium, 16MB of RAM, removable 648MB hard drive, built-in CD-ROM drive.

Expansion Options: Two Type II PC Card slots, docking station with two ISA slots ($649), 32MB of RAM.

$8,399 est. street price
Panasonic Personal Computer Corp.
(800) 742-8086
Reader Service No. 668

Tadpole P1000

Usability ****
Performance *****
Technology ****
Verdict ****
Speed to burn.

Features (as tested): 100MHz Pentium, 16MB of RAM, removable 810MB SCSI-2 hard drive.

Expansion Options: Two Type II PC Card slots, 128MB of RAM.

$8,495 est. street price
Tadpole Technology
(800) 232-6856
Reader Service No. 669

Guide to the Ratings: *****Excellent ****Good ***Acceptable **Poor *Unacceptable

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Circle 229 on reader service card.

Color Proofs You Can Afford

A printer that's capable of high-quality dye sublimation *and* cost-effective thermal transfer for less than $1,000? With a no-frills setup and easy-to-use Windows software? Print quality good enough to impress the boss? It's all in one small box with NEC's SuperScript Color 3000 printer.

The biggest boon of a dual-technology printer is the fact that you can proof documents in the faster and less expensive thermal wax-transfer mode and save the costly and slow dye-sublimation mode for final output. Of course, this assumes that color quality is similar between the two modes so your proofs are accurate.

Windows Bias Unlike some color printers, setup and installation of the SuperScript Color 3000 was a breeze. It's the first color printer based on Microsoft Windows Printing System. What does this mean to you? Well, if you're a DOS user, you should stop reading now: You need Windows 3.1 to run the SuperScript Color 3000.

If you use Windows, however, this system makes for simple setup and easy-to-use drivers. You also receive lots of helpful messages as jobs print, including a diagram of where the paper is in the printing path, how many pages have printed, and an estimate of the time remaining to print the job.

Just be sure you have the horsepower to drive this printer: You need a souped-up system to reap the best performance. NEC recommends a 66MHz 486DX2, DOS 6.0, and 8MB of RAM, but even our Pentium test system with 16MB of RAM ran sluggishly when a job was printing—not ideal for printing font- and graphics-laden pages in dye-sublimation mode.

Mass-Market Color: At under $1,000, NEC's SuperScript Color 3000 is a steal. It delivers rich continuous-tone dye-sublimation color output and inexpensive thermal wax-transfer output in one.

Close Comparisons: The colors between thermal wax-transfer mode (left) and dye-sublimation mode (right) are close but not perfect. Still, the SuperScript Color 3000 produces eye-pleasing tones.

If you're looking for a fast color printer, keep on looking. The SuperScript Color 3000 won't win any awards for its speed. The thermal wax-transfer mode is fastest, and it still takes about 8 minutes to print a three-page presentation and about 18 minutes for a four-page newsletter with lots of graphics. In the higher-quality dye-sublimation mode, expect speeds that are four to five times slower. The same presentation and newsletter required nearly an hour to print.

Despite these slow print speeds, the SuperScript Color 3000's output was absolutely stellar for a printer in its class. The color matching between dye-sublimation and thermal wax-transfer modes was fairly close, though we did notice that the reds in our dye-sublimation output had more of an orange tint than the reds in our thermal wax-transfer output. All in all, the colors were rich, smooth, and consistent.

Money in the Bank The SuperScript Color 3000 also pays for itself in a relatively short amount of time. The cost for three-color thermal wax-transfer printouts is just 55 cents per page, compared to $3 per page for three-color dye-sublimation printouts. Therefore if you produce just four dye-sublimation proofs per month and ten thermal wax-transfer drafts, you'll save $98 per month over what it would cost to print all the pages in dye-sublimation mode. At this rate of savings, expect to pay for your SuperScript Color 3000 in less than a year.

If you're in the market for a double-duty printer with high-quality graphics output, you'd be hard-pressed to find a better deal than the SuperScript Color 3000. Its biggest drawback is the slow printing speeds. But if you can live with that, it offers a low price, great output, and two technologies in one printer. KYLA K. CARLSON

FILEBOX

SuperScript Color 3000

Usability	****
Performance	***
Technology	****
Verdict	****

Superb color output at a price that will keep you in the black.

Competition: Fargo's PrimeraPro Color Printer has the same dual-technology advantage, but it's slower, more expensive, and not as user friendly.

System Requirements: 25MHz 486SX, DOS 3.3, 4MB of RAM, a total of 12MB of combined virtual memory, 48MB of hard-disk space.

Cost per Page: 55 cents for three-color thermal wax transfer, $3 for three-color dye sublimation.

Resolution: 300 dpi in both output modes.

Technology: Thermal wax transfer and dye sublimation, Microsoft Windows Printing System.

$999 est. street price
NEC Technologies
(800) 632-4636, (508) 264-8000
Reader Service No. 670

PHOTOGRAPH BY ARNOLD TOSELID

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

FLEXIBILITY

The varied demands of today's marketplace require small businesses to perform an increasing variety of functions.

Whether it's in sales or finance, realty or retail, flexibility is the new key to long-term success. In these days of doing more with less, the way in which companies allocate resources has changed. In the past, financial clout often determined who came out on top. Today, faced with competitive and market pressures unimagined ten years ago, companies must now find have a significant advantage over those tied down by convention, bureaucracy and big-spending.

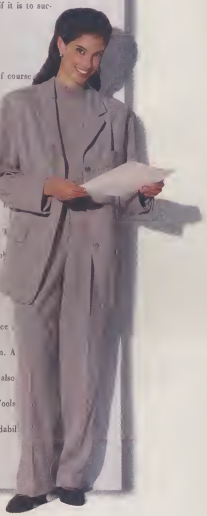
Flexibility and a sense of adventure must be a part of any company's corporate culture if it is to succeed into the 21st century.

•

Large companies, of course a greater challenge than small busin generally have an easier time impleme cies. But no matter what the size o companies with an adaptable stru outlook are better positioned to capture than their competitors; their ability to cus, or even redefine, their business o sures their continued success.

•

Willingness to embrace just the beginning of this reorientation. A response to rapidly evolving situations also a careful selection of business tools. Tools chosen for their versatility and dependabil



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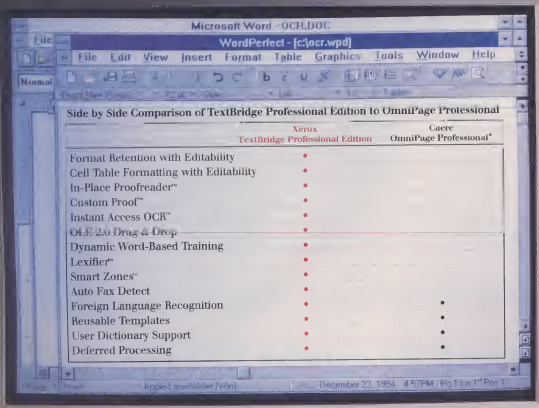

Side by Side Comparison of TextBridge Professional Edition to OmniPage Professional

	Xerox TextBridge Professional Edition	Caere OmniPage Professional*
Format Retention with Editability	•	
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OLE 2.0 Drag & Drop	•	
Dynamic Word-Based Training	•	
Lexifier™	•	
Smart Zones™	•	
Auto Fax Detect	•	
Foreign Language Recognition	•	•
Reusable Templates	•	•
User Dictionary Support	•	•
Deferred Processing	•	•

the book on OCR. table of contents.

TextBridge® Professional Edition retains the format of the documents you scan—complete with fully editable text, tables, and graphics.

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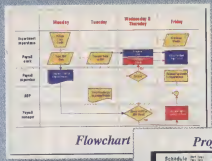

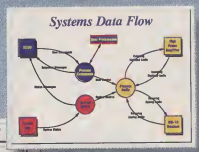

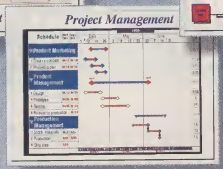

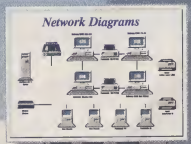

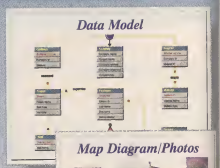

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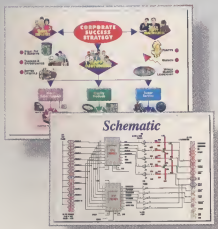

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RUDA1517

New! SOFTWARE: Norton Navigator for Windows 95 · UnInstaller 3 vs. Winformant Professional · Lotus Forms vs. InForms 4.1 · Acrobat Capture

Quicken Financial Planner

Plan to Retire with Confidence

SNEAK PREVIEW

Baby boomers save only 34 percent as much as they will need to maintain their current standard of living at retirement. Oh well, there's always Social Security, right? Wrong. The ratio of working Social Security contributors to nonworking recipients was 30-to-1 in the 1950s, but it will be just 2-to-1 by the time my son is in the salt mines and contributing to my Social Security benefits—reason enough to boot up Intuit's new Quicken Financial Planner.

If you're like most Quicken users, you already have a fair idea of where your finances stand today and, thanks to its calculators for retirement and college savings, even where they're headed. But Quicken Financial Planner lets you plot your financial future in much greater detail.

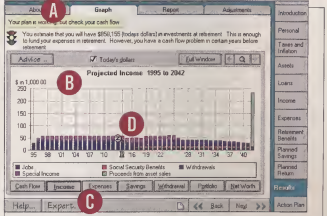
What If? The trouble with financial planning is that much of the future is speculative. Who can predict the endgame of his or her career? Still, it's better to make estimates and plan accordingly than to wander through life aimlessly building up credit-card debt and lottery ticket stubs. Quicken Financial Planner's crystal ball is better than most because it uses demographic data and actuarial tables to help you fill in the blanks on your future.

Given your birth date and a few personal details, Quicken Financial Planner will predict your life expectancy. (It helps to be a nonsmoking female runner.) Factor in the age at which you think you'll retire, add a few years to your life span in case you get lucky, and you're on the road to figuring out how large a nest egg you'll need.

Taxing Times Quicken Financial Planner doesn't forget about taxes and inflation, which loom especially large if you're among the growing number of self-employed people who pay more than 15 percent of their earnings in Social Security and Medicare on top of a 15 to 28 percent federal tax rate. Quicken Financial Planner contains powerful financial calculators under its hood that walk you through very complex calculations in minutes. For example, enter some basic information about your current home and its projected sale date, and the program will spit out a rigorous analysis of the tax consequences and projected gains of your situation.

After you've entered all the pertinent data, Quicken Financial Planner delivers a financial plan in an extensive series of graphs and reports with considerable commentary on your weak points and suggestions for improvement. You can tinker with the numbers to create different financial scenarios the way you would using a spreadsheet, and if things such as your salary or marital status change, it's easy to make the necessary corrections.

Quicken Financial Planner will give you as thorough an outlook as any professional planner could, but it does this for hundreds of dollars less. And as with all things PC, you gain more control of your plan and your life. **MIKE HOGAN**



Work Your Plan: Baby boomers need help planning for their retirement, and Quicken Financial Planner is just the tool they need for everything from taxes to investment and beyond.

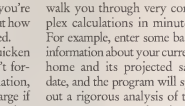
A. Assembling your financial plan is a **simple import** from Quicken.

B. Quicken Financial Planner is rich with **graphs** that detail every major aspect of your financial plan.

C. Click for **help or advice** from *Newsweek*'s Jane Bryant Quinn.

D. Quickzoom uncovers the origins of graph points.

The Wiz: Quicken Financial Planner lets you track inflation trends for an easy "what if" analysis of your financial standing.



FILEBOX

Quicken Financial Planner

Usability ★★★★★
Technology ★★★★½
Verdict ★★★★½
Simple interface hides power and completeness.

Competition: Reality Online's WealthBuilder and Ernst & Young's Prosper, neither of which includes tax features or Quicken imports.

Minimum System Requirements: 386 (33MHz 486DX for CD-ROM version), 4MB of RAM (8MB for the CD-ROM), 16MB of free hard-disk space, DOS 5.0, Windows 3.1.

Special Features: Support for 401(k), IRA, 403b, SEP, Keogh plan, and tax-deferred annuities; technical review by KPMG Peat Marwick; advice from Jane Bryant Quinn and Callan Associates; Morningstar profiles of 4,400 mutual funds.

Support: Monday through Friday, 5 a.m. to 5 p.m. PST.

$39.95 est. street price for floppy or CD-ROM version
Intuit
(800) 781-5999
Reader Service No. 671

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Refine and Redefine Windows 95

SNEAK PREVIEW

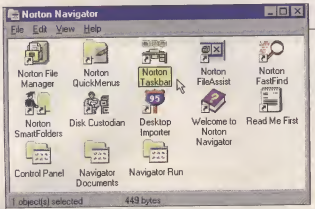
With all the attention it's been getting, you might expect Windows 95 to be the be-all and end-all of operating systems. But if you think you'll be able to jump in and immediately become more productive with it, you may have another thing coming. And the last thing you can afford is downtime while you're adjusting.

Enter Norton Navigator for Windows 95, the first system enhancement package for the new OS. After you've given Windows 95 a go, install Norton Navigator. We checked out an early release of the utility and found that it boosts productivity, is easy to use, and makes working with Windows 95 much more convenient.

Windows 95 and More

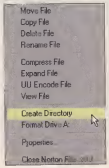
So what does Norton Navigator do? It makes Windows 95 habitable. Microsoft gives you a new way to manage files, but when it comes to serious file crunching, you're stuck with lame old File Manager. Norton Navigator's file manager, on the other hand, is a 32-bit version of the excellent PC Tools for Windows file manager with a few goodies thrown in: built-in Internet FTP mapping and file transfer, full support for long filenames, PKzip/unzip compression, indexed FileFind features that have user-definable options, and much more.

Even better, you'll find a set-and-forget utility that automatically adds support for long filenames to the dialog boxes of all your 16-bit Windows applications that use common dialog boxes. This feature, which had not yet been enabled in the early beta version we tested, will also add support for long filenames to Microsoft Word 6.0 for Windows and a handful of other popular programs that flaunt the common dialog-box spec.



Norton Power Pack: Symantec's Norton Navigator provides a host of utilities and features designed to complement Windows 95. Most notable are the full-featured file manager, QuickMenus, the Taskbar, and the application-enhancing FileAssist.

16-Bit Transition: Enable Norton Navigator's FileAssist, click the tiny file manager on your 16-bit Windows applications, and you have an easy way to create new directories from within your application dialog boxes. You can also automatically add support for long filenames to the dialog boxes of all your 16-bit Windows programs.



Useful Features Norton Navigator has a number of features that you'll use every day, including a broad set of Start Menu, Taskbar, and pop-up menu customizations aimed at streamlining Windows 95 tasks.

QuickMenus modifies the Documents, Settings, and Run menus on Start to cascade or cascade deeper, which minimizes the number of Explorer windows you have to open and streamlines repetitive operations. It also adds controls to pop-up menus, the best of which is Folder Navigator. Right-click on any folder, and you'll see the Navigator menu item. Use it to quickly open the folder you want rather than having to open a dozen folder windows to find it.

Norton Taskbar inherits PC Tools for Windows' well-designed virtual desktop features. Just one click and you're in a space that you've customized for a specific task (surfing the Net, for example). There's also Norton QuickLaunch, which converts an area of the Taskbar to act as a program-launching toolbar. Click one of its program labels and you're in a favorite program.

FileAssist places tiny icons that rest on the menu bars of the Open, Save, and Save As dialog boxes of your 16-bit Windows applications. They provide pop-up menus for functions such as opening previously opened files, deleting files, and creating new directories.

The nicest thing about Norton Navigator is that it isn't a radical transformation of Windows 95. Rather, it's an enhancement that appears to be a natural extension of the OS. And if you don't like one of Norton Navigator's features, just turn it off. You can even turn off the enhancements altogether and enjoy Norton Navigator's superior file manager and unobtrusive dialog-box features. SCOT FINNIE

FILEBOX

Norton Navigator for Windows 95

Usability ★★★½
Technology ★★★½
Verdict ★★★★½
A natural extension of Windows 95.

Competition: None, but it serves as an enhancement of Windows 95 and an upgrade for Norton Desktop for Windows 3.1 and PC Tools for Windows 3.1

System Requirements: Windows 95 and a PC capable of running Windows 95 with at least 8MB of free hard-disk space (Symantec recommends a 50MHz 486 or faster CPU).

Top Utilities: Norton File Manager (which offers much more functionality than is available in Windows 95), SmartMenu, QuickMenus, Taskbar (which includes the virtual desktop features), Folder Navigator, and QuickLaunch.

$100 est. street price ($45 upgrade from Windows 3.1 versions of PC Tools and Norton Desktop)
Symantec Corp.
(800) 441-7234, (408) 253-9600
Reader Service No. 672

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Alexandre Patty had a rather distinctive approach to descending a staircase. Since he obviously preferred doing things the hard way, he probably wouldn't have been interested in faxing with Delrina WinFax PRO.

Given the choice between using an elevator or your head to go down a flight of stairs, you'd probably opt for the easier way, right? So if you're not already faxing with the award-winning WinFax™ PRO 4.0 fax software, you should be. Because it is, quite simply, the easiest and most convenient way to send and receive faxes. By faxing with your PC, you'll save countless trips walking to the fax machine. And WinFax PRO makes sending a fax from within any Windows application as easy as printing a document.

WinFax PRO is available alone or in the Delrina Communications Suite™

Organizing sent and received faxes takes just a couple of mouseclicks, and you can even schedule a fax transmission for a specific date and time in the future. So visit your local dealer today, or call 1-800-664-2782 to upgrade or to order WinFax PRO, the world's best-selling fax software. Anything less is sure to be a headache.

Year after year, Delrina WinFax PRO has won nearly every major industry award – for features like fax autoforwarding, remote retrieval and handy graphics tools, including one that lets you add your own signature. You also get dozens of ready-to-use cover pages, OCR, group faxing, drag-and-drop addressing, and you can even have a document faxed to some and e-mailed to others. No wonder *PC Computing* recently said, "The best fax software just got a whole lot better."

DELRINA

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Circle 167 on reader service card.

Cleaning Up After Windows Apps

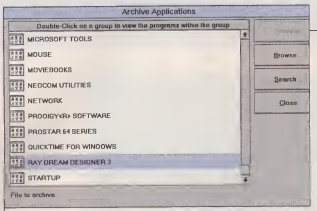
No matter how ugly DOS is, you can't help but long for the good old days when removing an unwanted program simply meant deleting all the files in a single subdirectory. Ridding your hard disk of Windows applications, on the other hand, is like getting sand out of a wet tennis shoe.

Not surprisingly, a cottage industry of uninstallers has emerged, led by UnInstaller. MicroHelp's latest version, UnInstaller 3, simplifies program removal while expanding its scope to include other Windows maintenance matters. But UnInstaller has some new competition in Neocom Microspecialists' Winformant Professional, which also goes beyond the uninstall routine.

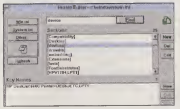
Zip Zap UnInstaller is now smarter about connecting INI references and hard-to-identify files such as DLLs to their parent programs and removing them. Its excellent default Recommended setting lets you quickly accept its decisions rather than go through additional steps, though there's still an Advanced setting if you want total control. UnInstaller makes a report of everything it does, and it's forgiving: It automatically makes a compressed backup that enables you to restore a program if you mistakenly remove it from your drive.

This version also adds a nice preemptive touch. A new feature called Program Manager Sentry prompts you to consider uninstalling an application whenever you try to delete a program icon.

A new Windows Cleanup routine lets you weed out dozens of other files you may not want, including font, help, temp, and wallpaper files. Windows Cleanup lets you see (or hear) what the files are, then delete them if you like. New Move and Transport features let you move complete applications (with all your settings and preferences intact) to new directories, drives, or computers. And an Archive utility lets you compress any seldom-used applications.



Packing It Away: A new archiving feature in UnInstaller 3 lets you compress and store seldom-used applications. A few clicks decompresses an application and brings it back to life.



Inside Job: The Profile Editor in Winformant Professional enables you to edit Windows initialization files such as WIN.INI.

Detective Work Winformant Professional is in many ways less refined and automatic than UnInstaller, but it offers a broader definition of what it means to clean up after Windows. Its uninstall routine is exceptionally quick—it does in seconds what often takes minutes in UnInstaller—and it lets you delete multiple applications at once. The program is not as informative as it could be—no report is generated, for example—and there's no safety net for resurrecting programs once they're gone. But some advanced users might prefer speed to safety. (UnInstaller's backup feature alone is reason enough for many to choose it.)

Winformant has other tools you may appreciate if you're the hands-on type. It has a powerful searching utility that lets you edit, erase, or run files you find based on up to 20 criteria. You can save searches and reuse them, too. And there are utilities for rapidly exiting or restarting Windows and separate programs for editing INI files, removing redundant DLL files, and reviewing and testing swap-file settings. All are accessible from a toolbar.

Despite their claims to the contrary, both programs occasionally leave orphaned files and unneeded settings in your AUTOEXEC, CONFIG, and INI files. Programs that affect basic system functions such as sound and telecommunications are especially hard to wipe clean. But in our tests both uninstallers performed quite well, removing all or nearly all files and settings. UnInstaller tends to err on the side of caution, while Winformant zips through with greater abandon (unless you opt to approve each deletion).

Though we used UnInstaller and Winformant with Windows 3.1, both programs bill themselves as Windows 95 ready. Neither supports 32-bit applications, however.

Ideally, Windows applications would have their own removal routines built in. But until that happens, UnInstaller 3 is a safe bet for the cautious, while Winformant Professional offers a feature-rich Windows toolkit. CHRIS O'MALLEY

FILEBOX

UnInstaller 3

Usability ★★★★½
Technology ★★★★
Verdict ★★★★½
Zaps programs safely from your hard drive.

System Requirements: 4MB of RAM, 4.5MB of hard-disk space (16MB recommended), Windows 3.1.

569.95 est. street price
MicroHelp
(800) 777-3322
Reader Service No. 673

Winformant Professional

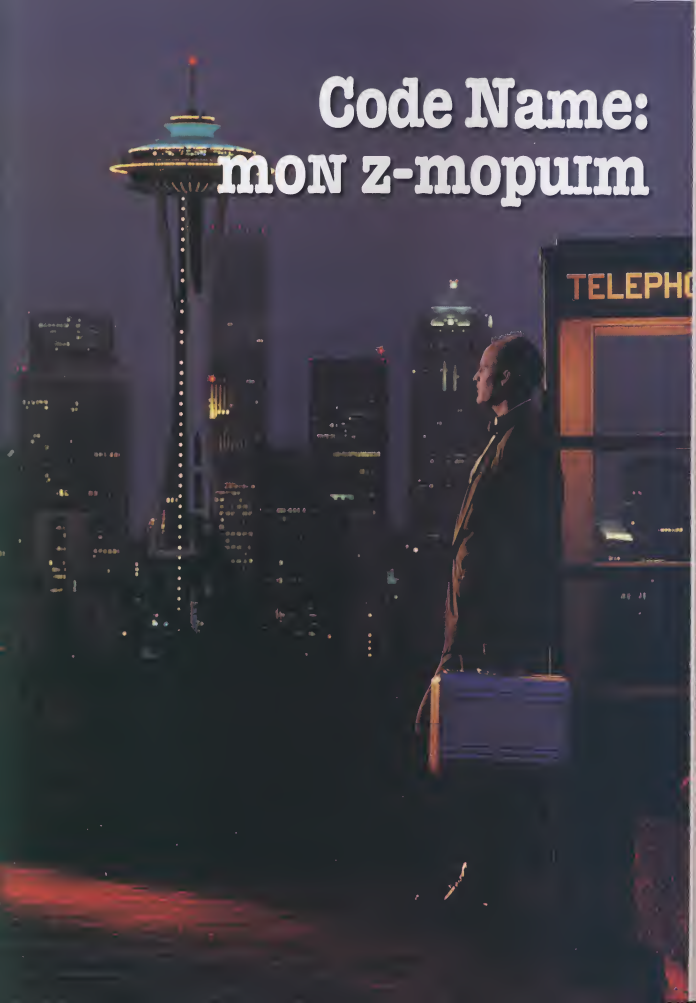
Usability ★★★
Technology ★★★★
Verdict ★★★½
Fast uninstall, but no frills.

System Requirements: 4MB of RAM, 2MB of hard-disk space (12MB recommended), Windows 3.1.

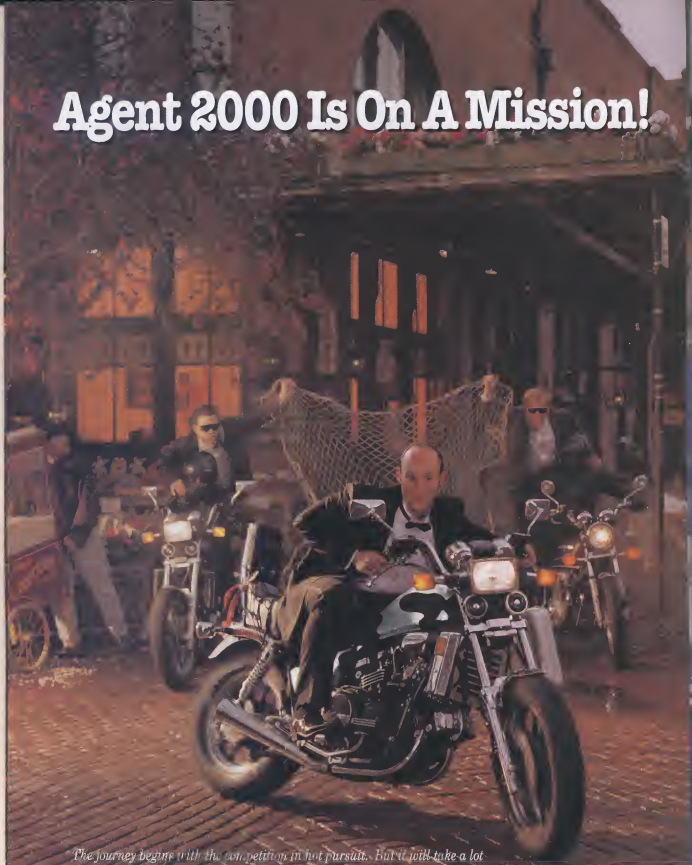
539.95 est. street price
Neocom Microspecialists
(800) 766-6861
Reader Service No. 674

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Code Name: mon z-mopuim

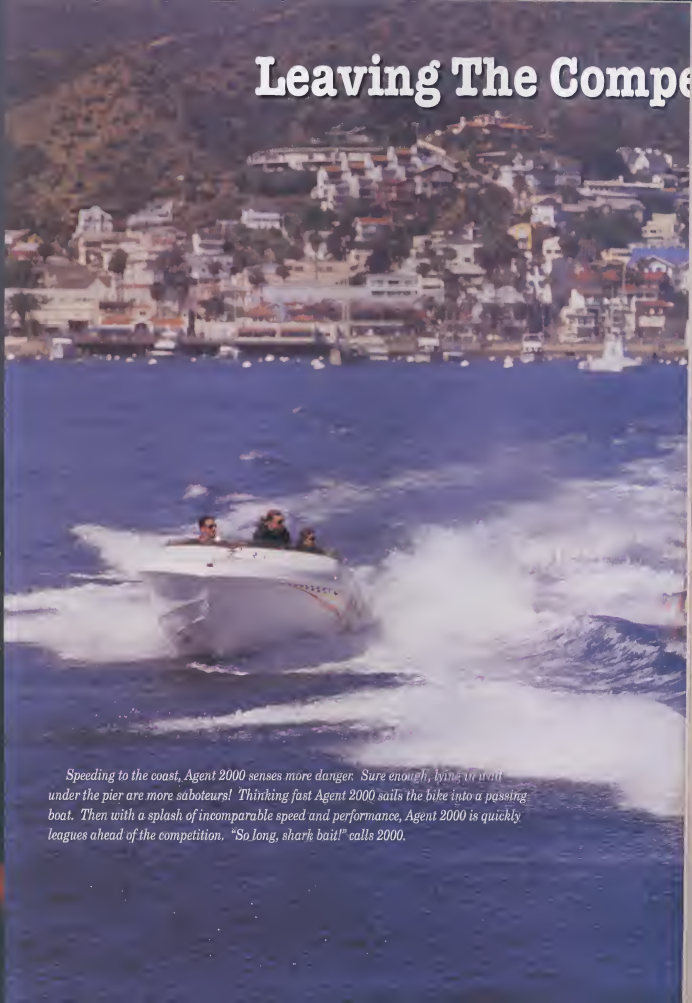


Agent 2000 Is On A Mission!



The journey begins with the competition in hot pursuit. But it will take a lot more than they've got to overtake Agent 2000. The perfect combination of speed and power give Agent 2000 the outstanding performance to stay ahead of the pack. "I know just the trick," thinks 2000. And with that, the 133-horsepower kicks in, leaving the competitors in the dust.

Leaving The Compe



Speeding to the coast, Agent 2000 senses more danger. Sure enough, lying in wait under the pier are more saboteurs! Thinking fast Agent 2000 sails the bike into a passing boat. Then with a splash of incomparable speed and performance, Agent 2000 is quickly leagues ahead of the competition. "So long, shark bait!" calls 2000.

etition In The Wake ...

The exchange went off without a hitch. Soon the city lights would be far behind. At dawn, Agent 2000 must begin the journey back. When the metallic briefcase is safely returned to headquarters in North Sioux City, South Dakota, the mission will be complete. The happiness of computer users everywhere is at stake. For in the briefcase is Gateway 2000's Secret Code — a new way to bring all PC users the latest computer technology at the best value on the planet. Undaunted by thoughts of the competitors' plans to thwart the mission, Agent 2000 keeps cool and races ahead to ensure all Gateway 2000 customers tomorrow's technology today.

The Best Performance

Gateway 2000®'s dossier is filled with accounts of great feats to bring PC users the latest computer technology and unmatched performance. It's our strategy to ensure all Gateway customers the tools to take them far into the future.

P5-133XL!

In a quest that took us to the ends of the earth, we brought you "Fastest PC in the World" — Gateway's P5-120XL (May 1995, *PC/Computing*). Now we've outdone ourselves by introducing the Gateway 2000 P5-133XL, a computer that's **significantly** faster than the fastest PC in the world! Equipped with a 133MHz Intel® Pentium® processor, 16MB EDO performance-enhanced memory, 256KB pipelined burst cache, 1.62GB IDE hard drive and a 4X three-CD changer, this machine is powerful and fast enough to navigate you through any risky computing situation!

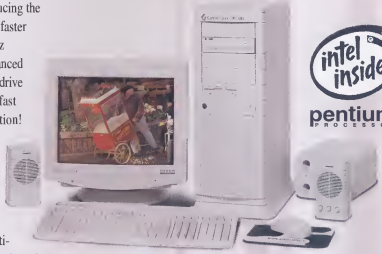
EDO (Extended-Data-Out) Memory

The next time you've masterminded an unforgettable plot, you'll want plenty of memory to back you up. EDO performance-enhanced memory gives you high-speed memory for your memory-intensive graphics, demanding number-crunching applications and future multitasking environments like Windows™ 95. And the combination of EDO memory and pipelined burst cache, on 120MHz and 133MHz systems, gives you the latest memory technology and the performance of next-generation cache, increasing system performance up to 20 percent!

Hard Drives

If you're thinking the bigger the better, you're right on. All Gateway Pentium processor-based systems are equipped with 730MB, 1GB or 1.62GB IDE hard drives. The 1.62GB hard drive is standard on the P5-133XL — or you can easily upgrade to it. It's the largest IDE hard drive to be found, featuring Mode 4 support, 9ms access time and a 12.5Mb/s data transfer rate.

By design, Gateway has gone to extremes to bring you everything you need for thrilling, action-packed system performance.



intel inside pentium PROCESSOR

GATEWAY 2000

"You've got a friend in the business."®

800-846-2062

2000 Defends All PC Buyers!

With a flight ready for take off, Agent 2000 is sabotaged! In a flurry of arms and legs, the unworthy opponents are overthrown. They cannot defeat 2000's sheer will and determination to deliver the best features, quality and value to all PC users.

The Best Features

Gateway 2000® beats the competition to the punch with the world's best features!

4X Three-CD Changer

The multimedia world gains major ground with the introduction of Gateway's 4X three-CD changer! Load this fast 4X CD-ROM drive with three CDs and you have 1.8GB of data at your fingertips. The 4X three-CD changer is either standard or available as an upgrade option on all Gateway desktop systems. All Gateway systems with 4X CD-ROM drives give you a 600KB data transfer rate for true full-screen, full-motion video and it's ATAPI compliant and ready for Windows™ 95.

Software

You can have action and excitement for the whole family — and the tools to conquer all *your* special missions. Gateway outfits you with incomparable software applications on all our systems. Choose a Family PC™ multimedia system and be transfixed by Gateway's new Generations Software Collection including 51 software programs! Professional Gateway PCs include Microsoft® Office Professional 4.3, the world's number-one selling software suite. And all Gateway desktop PCs include MS Windows for Workgroups 3.11 — the fastest version of Windows available (today).

Vivitron™ Monitors

Electric color, a razor-sharp focus and crystal clear images — all from a Gateway 15- or 17-inch Vivitron monitor! These monitors feature Sony® Trinitron® tube technology — technology that the most discerning viewers have relied on for decades.

The Best Service and Support

Gateway 2000 delivers another powerful blow to the competition by providing all our customers with award-winning, **toll-free** technical support for the life of their Gateway system! All Gateway desktop systems and monitors are also covered by a three-year limited warranty. Write or call us for a free copy of our warranty.

The Best Quality

For nearly 10 years, Gateway 2000 prevails when it comes to bringing PC buyers the highest-quality computer components available — the best we can possibly offer. The evidence speaks for itself with the MS Mouse, Gateway's programmable AnyKey® keyboard, and of course, our trademark cow-spotted boxes!

intel inside pentium PROCESSOR

GATEWAY2000

You've got a friend in the business

800-846-2062

It's A Quick Getaway With

"Home free," thinks Agent 2000. Just then the flight attendant approaches. "Hello Agent 2000, and welcome to Ambush Airlines. May I place your briefcase in the overhead compartment? No? Well then, perhaps a better place is smacked upside your head!" Agent 2000 knows it's now or never. Prying open the airplane door, 2000 checks the combination compass/wind velocity chart, jumps ... and lands only a tractor ride away from Gateway 2000 headquarters!

The Best Portable PCs

Don't be fooled by stripped-down portables posing as great values. They'll just leave you up in the air without the performance that you really need. Outsmart them by choosing Gateway 2000®'s high-performance portables, the Liberty™ and ColorBook.2™. They're loaded with the power to handle the increasing demands of today's (*and tomorrow's*) technology.

Performance

When your special assignments take you out in the field, have outstanding performance without anything to weigh you down. Free yourself with the 4.2-pound Gateway Liberty portable PC. The DX4-100 Best Buy model includes 100MHz of processing power with 256K L2 cache for Pentium® processor-like performance. Gateway also gives you plenty of RAM that will increase battery life and improve your overall system performance! With 24MB RAM and a 720MB hard drive, the Liberty DX4-100 Best Buy gives you the speed and power to run all your hard core applications without a snag.

Features

The Liberty's sleek 4.2-pound design delivers all the goods with a 10.4-inch screen, infrared technology, an impressive battery life and incredible software applications pre-installed.

The screen display on your portable should be a crucial buying factor. Our 10.4-inch color screen on the Liberty produces vivid

Gateway 2000's portable PCs — the ColorBook² and Liberty.

GATEWAY 2000® LIBERTY™

- 4.2 Lbs., 10" x 8" x 1.6"
- 10.4" DSTN Color Display
- 1MB Video RAM
- Choice of Desktop IR Receptor or External Floppy Drive
- Intel® 486 DX2 or DX4 Processor
- Instant On
- NiMH Battery & AC Pack
- 2 PCMCIA Type II Slots
- EZ Point™ Integrated Pointer
- Removable Hard Drive
- 78-Key Keyboard
- Parallel, Serial, VGA & PS/2® Ports
- OAG® FlightDisk®, World Clock, & Ascend® personal information manager (PIM) for use w/ Franklin Day Planner®
- MS-DOS® 6.22 & WFW 3.11
- Microsoft® Works for Windows™ 3.0 or MS Office Professional 4.3**

LIBERTY DX4-100 Base

10.4" DSTN Color Display, 8MB RAM, 340MB HD, MS Works

$2999

DX2-50 $2749

LIBERTY DX4-100

10.4" DSTN Color Display, 12MB RAM, 540MB HD, 256K L2 Cache, MS Works

$3499

*LIBERTY DX4-100 Best Buy 48-Hour QuickShip**

10.4" DSTN Color Display, 24MB RAM, 720MB HD, 256K L2 Cache, TelePath™ 14.4 XJACK® Fax/Modem, Extra Battery, Leather Carrying Case, Desktop IR Receptor, External Floppy Drive, MS Office Professional 4.3**

$4499

COLORBOOK²™

- 5.7 Lbs., 11.65" x 8.5" x 1.77"
- 10.3" DSTN Color Display
- Intel 486 DX4 Processor
- Minimum 8MB RAM (expandable to 24MB)
- 1.5MB Video RAM (includes 512KB cache)
- Removable Hard Drive
- 3.5" Diskette Drive
- Integrated 16-Bit Sound and Speaker
- NiMH Battery & AC Pack
- EZ Point Integrated Pointer
- 2 PCMCIA Type II Slots
- 85-Key Keyboard
- Parallel, Serial, VGA & PS/2 Ports
- MS-DOS 6.22 & WFW 3.11
- MS Works for Windows 3.0 or MS Office Professional 4.3**

COLORBOOK² DX4-100

8MB RAM, 340MB HD, MS Works 3.0

$2999

COLORBOOK² DX4-100 Deluxe

8MB RAM, 540MB HD, TelePath 14.4 Fax/Modem, Carrying Case, MS Office Professional 4.3**

$3499

COLORBOOK² DX4-100 Best Buy

16MB RAM, 720MB HD, TelePath 14.4 Fax/Modem, Carrying Case, MS Office Professional 4.3**

$3999

LIBERTY PROFESSIONAL PACK

MS Office Professional 4.3, PCMCIA TelePath XJACK 14.4 Fax/Modem, Extra NiMH Battery, Leather Carrying Case

$449

**48-Hour QuickShip program applies only to the Liberty DX4-100 Best Buy configuration. Your PC will be delivered within two business days from the time of order. No additions or deletions can be made to the configuration. Available for approved credit card orders only while quantities last. Domestic U.S. orders only. Call us for details about other QuickShip offers.*

***MS Office Professional 4.3 includes Word, Excel, PowerPoint® presentation graphics program, and Access® database.*

SERVICE AND WARRANTY

- Lifetime portable-specific toll-free service and support
- One-year limited parts warranty
- 30-day money-back guarantee
- Special VIP warranty. We'll ship a replacement to you within 24 hours during warranty. Only available at the time of purchase for an additional $100.

PERIPHERAL OPTIONS

- Panasonic® KXL-D720 external CD-ROM drive **$299**
- ColorBook² port replicator **$49**
- PCMCIA 14.4 XJACK send/receive fax/modem **$159**
- PCMCIA network adapters, twisted pair **$129**
- Coaxial adapters **$159**
- Token Ring adapters **$399**

Toll free from Canada 800-846-3609

Toll free from Puerto Rico 800-846-3613

PORTABLE SALES

800-846-5257

610 Gateway Drive • P.O. Box 2000 • N. Sioux City, SD 57049-2000 • Phone 605-232-2000 • TDD 800-846-1778 • Fax 605-232-2023 • FaxBack 800-846-4526

Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

With a firm grip still on the metallic briefcase, Agent 2000 arrives at Gateway 2000 headquarters and is ushered into President Ted Waitt's office. There two Teds stand face-to-face!

"You've arrived with the Secret Code intact!" exclaimed Ted. "Excellent! Good work Agent 2000!"

With that, Agent 2000 removes her mask: it's Undercover Agent Monique! "Thanks Ted," she replied. "I could hardly wait to get back to North Sioux City. Just what is this code name 'mon z-mopuim?' Is it a new kind of mouse pad design?"

"No, no 2000," chuckled Ted, "much more important to our customers than that. But I'm afraid you were so expedient in returning that it's too soon to tell you. You see, there is a time-release lock on that briefcase. Anyone who opened it early would've activated an ink spill in the briefcase and destroyed the Secret Code!"

"Can't you please give me just a little hint?" pleaded 2000.

"Well, while you were on this special assignment, I was back here finding a way to bring Gateway 2000 customers all the newest technology with Windows 95!" exclaimed Ted. "The Secret Code is a way to get Microsoft's new operating system on a value-packed Gateway PC that's optimized for Windows 95! This combination of superior system performance and Windows 95 will revolutionize the way PC users compute! It's all part of Gateway 2000's formula of bringing customers the latest technology for the best PC values on the planet. ***For details about the Gateway's Windows 95 Secret Code, customers can call us at the 800 number below and ask!"***

"Brilliant Ted!" exclaimed 2000. "I can hardly wait to get the Secret Code to Windows 95."

"Yes, the wait will soon be over," said Ted. "Thanks again, 2000. Oh, you didn't run into any problems did you?"

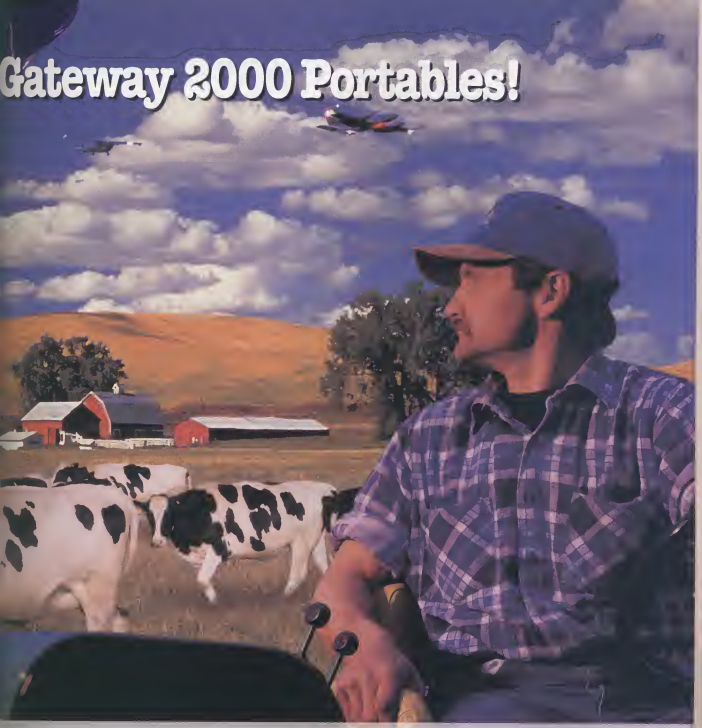
"Nah, piece of cake," she replied.

GATEWAY 2000

"You've got a friend in the business."

800-846-2062

Gateway 2000 Portables!



color, brightness and clarity. You'll also find that the 10.4-inch screen has 23 percent more viewing area than a 9.4-inch screen, allowing you to see more spreadsheet cells, full word processing documents, and giving you the ability to read small fonts better.

The Gateway Liberty adds even more mobility with its infrared (IR) technology. Using wireless file transfer, you can transfer files between your Liberty and desktop (or between two Liberty PCs!) without cables. IR is also important for tomorrow's portable computing needs. Windows™ 95 was engineered with IR in mind, and IR-ready printers will be available soon.

Not enough battery life and suddenly your portable PC isn't much help! Nickel metal-hydride batteries (NiMH) on the Liberty will give you the best performance. You'll get up to four hours or more with power management. The Liberty was also designed to be upgradable to lithium ion batteries.

The value of your Gateway portable PC goes up, up, up with pre-installed software applications. All Gateway portable PCs include Microsoft® Works for Windows™ 3.0 or MS Office Professional 4.3 pre-installed. You also get the OAG® FlightDisk,® World Clock, and Ascend® software applications.

Looking for ways to make your getaways more productive? Call a Gateway 2000 portable sales representative today!

Gateway 2000® Family PC™ Systems

4DX2-66 FAMILY PC

- Intel® 66MHz 486DX2 CPU*
- 8MB RAM
- 540MB 11ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- 4X CD-ROM, 16-Bit Sound Card & Altec™ ACS-5 Speakers
- TelePath™ IIv 14.4K Fax/Modem Communication Center
- 3.5" Diskette Drive
- 14" .28 CrystalScan® Color Monitor
- 7-Bay Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS® 6.22 & WFW 3.11
- Generations Software Collection
- 3-Year Limited Parts Warranty

$1699

P5-75 FAMILY PC

- Intel 75MHz Pentium® Processor*
- 8MB EDO Performance-Enhanced Memory
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM, 16-Bit Sound Card & Altec ACS-5 Speakers
- TelePath IIv 14.4K Fax/Modem Communication Center
- 3.5" Diskette Drive
- 15" .25dp Vivitron™ Color Monitor
- 7-Bay Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Generations Software Collection
- 3-Year Limited Parts Warranty

$2199

P5-100 FAMILY PC

- Intel 100MHz Pentium Processor*
- 8MB EDO Performance-Enhanced Memory
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X3-CD Changer, 16-Bit Sound Card & Altec ACS-5 Speakers
- TelePath IIv 14.4K Fax/Modem Communication Center
- 3.5" Diskette Drive
- 17" .26dp Vivitron Color Monitor
- 7-Bay Desktop Case
- AnyKey® Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Generations Software Collection
- 3-Year Limited Parts Warranty

$2899

Generations SOFTWARE COLLECTION

- Microsoft® Encarta™'95 • MS Bob™ • MS Money 3.0 • MS Works 3.0 • MS Publisher 2.0 • MS Publisher Design Pack • MS Cinemania®'95 • MS Bookshelf® • MS Composer Collection: Beethoven, Mozart and Schubert • MS Wine • MS Arcade: Missile Command™, Asteroids, Tempest™, Centipede® and Battlezone™ • MS Dinosaurs • Mayo Clinic® Family Health Book • Mayo Clinic Family Pharmacist • plus 31 popular MS entertainment games.

Professional Systems

4DX2-66

- Intel 66MHz 486DX2 CPU*
- 8MB RAM
- 540MB 11ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- 2X CD-ROM
- 3.5" Diskette Drive
- 14" . 28 CrystalScan Color Monitor
- 7-Bay Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- MS Works 3.0 & Money 3.0
- 3-Year Limited Parts Warranty

$1449

P5-75

- Intel 75MHz Pentium Processor*
- 8MB EDO Performance-Enhanced Memory
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM
- 3.5" Diskette Drive
- 15" .25dp Vivitron Color Monitor
- 7-Bay Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS DOS 6.22 & WFW 3.11
- MS Office Professional 4.3**
  Bookshelf® & Money 3.0
- 3-Year Limited Parts Warranty

P5-75 $1999
P5-90 $2199

(90MHz Pentium processor, 730MB HD, 8MB RAM, 256KB cache)

P5-100 BEST BUY

- Intel 100MHz Pentium Processor*
- 8MB EDO Performance-Enhanced Memory
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X 3-CD Changer
- 3.5" Diskette Drive
- 15" .25dp Vivitron Color Monitor
- 7-Bay Desktop Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional 4.3**
  Bookshelf & Money 3.0
- 3-Year Limited Parts Warranty

$2499

P5-120 BEST BUY

- Intel 120MHz Pentium Processor*
- 16MB EDO Performance-Enhanced Memory
- 256KB Pipelined Burst Cache
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD-ROM
- 3.5" Diskette Drive
- 15" .25dp Vivitron Color Monitor
- 7-Bay Desktop Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional 4.3**
  Bookshelf & Money 3.0
- 3-Year Limited Parts Warranty

$2999

P5-133XL

- Intel 133MHz Pentium Processor*
- 16MB EDO Performance-Enhanced Memory
- 256KB Pipelined Burst Cache
- 1.62GB 10ms IDE Hard Drive w/ Mode 4 Support
- PCI Enhanced IDE Interface
- ATI Mach 64 Graphics Accelerator with 2MB VRAM
- 4X 3-CD Changer
- 16-Bit Ensoniq® Wavetable & Altec ACS-31 Speakers w/ Subwoofer
- TelePath IIv 28.8 Fax/Modem Communication Center
- 3.5" Diskette Drive
- 17" .26dp Vivitron Color Monitor
- 9-Bay Tower Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional 4.3**
  Bookshelf & Money 3.0
- 3-Year Limited Parts Warranty

$4399

If you can't find a system that suits your needs, call us and we'll be happy to custom build one for you.

***MS Office Professional 4.3 includes MS Word, Excel, PowerPoint® presentation graphics program, and Access® database.*

Energy Star EPA · PRIZE WINNER

Toll free from Canada
800-846-3609

Toll free from Puerto Rico
800-846-3613

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Flight Pack

Seven top-of-the-line flight CDs. Includes TFX™; Tactical Fighter Experiment, Aces Over Europe, Maximum Comanche®, Strike Commander, Privateer, Wing Commander™ Armada; and Warplanes. You also get a joystick and 20-disc storage rack. **$99**

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Six action-packed sports applications. Includes Unnecessary Roughness '95™, Hardball 4™; FIFA International Soccer; PGA Tour® Golf; NHL® Hockey '95; and NASCAR® Racing. Also includes Gravis GamePad™ and CD holder. **$99**

Monitors

Gateway 17-Inch Vivitron™ Color Monitor

Non-interlaced color monitor using Sony® Trinitron® tube technology, capable of 1280 x 1024 resolution in non-interlaced mode, .26 dot pitch.
Upgrade from a 14-inch CrystalScan® 1024NI monitor **$360**
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(Upgrade prices good only at the time of system purchase.)

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Features clear, sharp 600 x 300dpi black printing on plain paper with a variety of built-in typefaces. Color option also available. Includes parallel cables.
$299 (w/out color) **$339** (w/ color)
Call for other printer options.

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Forms That Follow Function

Chances are your company designs, tracks, and routes forms. Whether you want to turn your paper forms into electronic forms, redirect electronic forms over a network, or set up customized front ends to shared databases, both Lotus Forms and Novell's InForms 4.1 pack power into their drag-and-drop interfaces.

Visual Tools Lotus Forms offers crucial Open Database Connectivity (ODBC) support for pulling in data from any source and routes electronic forms over a network using Vendor Independent Messaging (VIM) and the Messaging Application Programming Interface (MAPI). It's not a Notes-specific add-on, but it works well with Notes for distributing electronic forms and it supports Notes Field Exchange (Notes F/X), which lets it use Notes as an OLE client.

With the included LotusScript 2.0 (Lotus's scripting language), it's easy to add DDE calls, conditional branching, and other features to forms—all of which let shared database users add graphics, electronically navigate through a series of forms via links, and pass forms to other networked sites.

Two separate modules—the Designer and the Filler—let you design and fill in forms and access data. Twelve customizable templates are included for purchase orders, time sheets, expense reports, and so on.

When embedding graphic files in a form with Lotus Forms, we ran into difficulties scaling the images. The program lets you crop images, but there are no other image editing tools provided. Also, there's no way to embed a graphic in a form while filling it in.

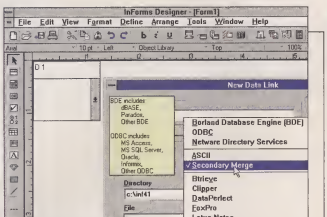
InForms provides a familiar metaphor for creating forms with button tools and drag-and-drop icons. Each item is treated as an object that can be assigned properties and commands. You link objects to specific databases, and InForms lets you send forms via a number of e-mail systems while maintaining their database links. It also lets you send forms via GroupWise 4.1, WordPerfect Office 4.0, Microsoft Mail 3.0, and any other VIM or MAPI system.

The Filler is a utility for using and testing forms that you create. It lets you control database security and create macros for entering and saving information into a database via a form. InForms supports OLE 2.0 and DDE as well as most database formats, including ODBC. However, the program doesn't support Lotus Notes as a mail system.

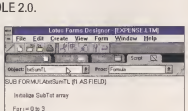
Despite InForms' power, it gets low marks for usability. Linking form objects to databases is not intuitive, the overall learning curve is steep, and the help files are weak.

Forms Factors Both Lotus Forms and InForms are contenders in the electronic forms market. While not as easy to master as JetForms 4.0 or Delrina's FormFlow, they offer more sophisticated e-mail tracking and routing. Lotus Forms integrates better with Notes-equipped offices and is easier to adopt. InForms offers the most power, but it takes a while to learn.

YAEL LI-RON AND BENJAMIN F. MILLER



Fill in the Blanks: Is it time to turn your paper forms into electronic forms or set up customized front ends to shared databases? Lotus Forms and Novell's InForms 4.1 make the job easier by supporting VIM, MAPI, ODBC, and DDE. InForms (above) also has direct support for OLE 2.0.



Form Factor: The interface in Lotus Forms is easy to use, offering right-mouse-button support and templates.

FILEBOX

Lotus Forms

Usability ★★★½
Technology ★★★
Verdict ★★★

A good forms creation and processing tool that lacks the power of object orientation.

Competition: Lotus Forms offers more sophisticated e-mail tracking and routing than JetForms 4.0 and Delrina's FormFlow, but it isn't as easy to use as those products.

System Requirements: 386 (486 for Designer), 4MB of RAM, 5MB of hard-disk space (9MB of hard-disk space for Designer), Windows 3.1 or later, VGA video or better, VIM or MAPI based e-mail system for routing forms.

Features: Designer and Filler modules; supports DDBC, DLE, and DDE.

$59 est. street price for 50 Fillers and 1 Designer
Lotus Development
(800) 346-1305
Reader Service No. 675

InForms 4.1

Usability ★★½
Technology ★★★★
Verdict ★★★½

A difficult but sturdy all-purpose database front end.

Competition: It has boosted its feature list (especially tracking and routing), but the object-oriented tools are still tough to master and the program lacks the ease of use found in JetForms 4.0 and Delrina's FormFlow.

System Requirements: 386, 4MB of RAM, 15MB of hard-disk space, Windows 3.1 or later, VGA video or better, VIM- or MAPI-based e-mail system for routing forms.

Features: Designer and Filler modules; supports DDBC, DLE, and DDE.

$495 list
Novell
(800) 861-2507, (801) 226-6000
Reader Service No. 676

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

DOUBLING YOUR RAM IS JUST FOR OPENERS.

SYSTEM REQUIREMENTS: A 386 PC, or greater, Windows 3.1/3.11 or Windows for Workgroups 3.11

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Doubling your PC's RAM is great.

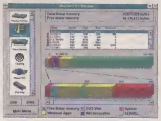
But with Hurricane™ it's just the beginning.

Hurricane – the newest brainchild from the memory magicians at Helix (creators of the award-winning NETROOM and Cloaking technology) is the first truly complete Windows™ performance enhancer.

Hurricane's RAM doubling feature gives you "unlimited" resources and boosts memory for your applications – speeding up your entire system and making "out of memory" messages a thing of the past.

But there's more...

Windows™ is now set to reach peak efficiency and velocity with Hurricane's virtual cache (for 32-bit file access), disk cache, RAM drive and print spooler, all of which share access to all your free memory.



DISCOVER how much memory you gain

But there's more...

Hurricane has its own screen accelerator* to make your system even faster, and unleashes the special features of your Pentium™ or Intel DX2/4 processor to milk it for every last ounce of performance. Plus, it's enhanced with Helix' exclusive WinGuard™ to protect your system from misbehaved applications.

But there's more...

Hurricane comes equipped with **WinGauge**™ for *unprecedented real-time performance analysis*. It's like flying a fighter jet with a heads up display of everything that's happening in your system. And, if you want to delve into your system's deepest secrets, tap into **Discover**™ – the most complete system analysis utility ever. It's right there.

INCLUDES FREE WINDOWS 95 UPGRADE†

And the price is ...

Now for the best part. At just **$79.95 (SRP)**, Hurricane will be blowing out of the store as fast as it comes in.

*for ISA/EISA VGA and SuperVGA (up to 800x600x256 color)
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Circle 215 on reader service card.

Publishing Pages Without Paper

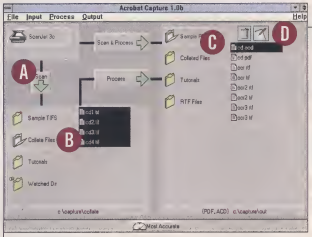
SNEAK PREVIEW

If you've never downloaded a tax form on April 14, browsed a well-designed online document on CD-ROM, or found an awe-inspiring fully formatted document on the Internet, the Adobe Acrobat Portable Document Format (PDF) revolution may have passed you by.

Over the past couple of years, Acrobat and its competitors have carved out a strange but popular category. Using a print driver or batch processor, they take files in any format and convert them to a format in which the files can be viewed, searched, annotated, and printed out exactly the way you want them to look—even by systems that lack the appropriate fonts.

Paper to PDF Although the premise of this may sound easy to dismiss, it's compelling: Sending fully formatted documents via e-mail can save corporations a small fortune every year in printing and distribution costs. Making attractive documents (even tax forms) available for download from the Web is a convenience that's hard to ignore. And with a viewer that can be freely distributed, Acrobat's PDF files can be scrutinized by Windows, Unix, DOS, Macintosh, or OS/2 users. Competitors such as Common Ground 2.0, Farallon's Replica, and Novell's WordPerfect Envoy offer only Windows and Mac readers.

So far so good. But until now the document that you wanted to distribute had to originate on your PC. If you received a PC-based fax or a printed document from another source, for example, you had no way to distribute it in PDF. Acrobat Capture promises to change all that. You provide the grayscale scanner, and Acrobat Capture provides the means to turn any clipping or flier into a faithfully formatted text-and-graphics file that you can print out or search.



Go with the Flow: In a multistep process like this—scanning, conversion via OCR, and writing out to a file—doesn't it make sense to use a process flow diagram to show the way? Each step shown here is a live, clickable object in Adobe's Acrobat Capture.

Close Enough: If Acrobat Capture can't recognize a word using OCR, it shows in a bitmap of the word in its place.

A. Start by **scanning files in grayscale** using ISIS or TWAIN drivers hooked into Acrobat Capture.

B. Direct files into the appropriate folders, and **watch for TIFF files** such as faxes that may arrive unannounced.

C. Name files with similar prefixes, and Acrobat Capture will **collate TIFF images** into one PDF file.

D. Use a **simple button click** to delete a file or call it up for proofing.

To do this, Acrobat Capture provides basic elements above and beyond PDF writing: a scanner interface (ISIS or TWAIN based), optical character recognition (OCR) that's as good as any we've seen, and a proofing utility called Acrobat Reviewer (because even a good OCR is far from perfect).

All these elements are managed by a flowchart interface that's easy to pick up and just hard enough to customize that the risk of someone accidentally changing default settings is relatively minor.

Gray Areas For now, Acrobat Capture is limited to grayscale scanning. This is by no means a severe limitation, but color would be useful. Its price tag, however, places it in the realm of workgroup solutions—$2,995 isn't the kind of price you'd expect to pay for OCR or portable documents. (Examples of PDF files we created during our evaluation of Acrobat Capture are available for download from PC Computing Online; see the Filebox above for details.)

With Acrobat Capture you can slash printing costs and offer faster, more convenient document distribution. If you can think of uses for PDF files—and with the integration of Acrobat Reader in Netscape Navigator, that's not hard—and can dedicate time to proofing and correcting OCR errors, it won't take long to justify buying this program. MATTHEW LAKE

FILEBOX

Acrobat Capture

Usability ★★★★½
Technology ★★★★
Verdict ★★★★
Sets the standard for electronic documents.

Competition: None, though you can get OCR from Caere and others, and portable documents from Common Ground 2.0, Farallon's Replica, and Novell's WordPerfect Envoy (part of the PerfectOffice suite).

Components: Front end (Acrobat Capture), OCR engine, PDF Writer, RTF export, and proofing application (Capture Reviewer).

Online Sample Files: Want to see what Acrobat Capture is capable of producing? We've put several of the PDF files we generated during this review online. See page 280 for instructions on how to log on; the filename is AC-EGS.ZIP.

Other Files: To view Acrobat Capture PDF files you need a reader. For instructions on how to download free readers for DOS and Windows, see page 280.

$2,995 est. street price
Adobe Systems
(800) 872-3623
Reader Service No. 677

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Introducing
Animator Studio

2D Animation, Paint and Synchronized Sound

If a picture is worth a thousand words, what if it could walk and talk?

How would you like to bring a whole new dimension to your ideas? To use animation to convey a sense of time and motion, paint to give them vividness and sound to give them a voice? You can, you know, and you can do it all with one new tool–Autodesk Animator Studio™ software for Windows. From the makers of 3D Studio® and Animator Pro,® it's so flexible you can even plug in Adobe Photoshop-compatible filters and paint with them. See, it's finally here. A way to leave nothing to your audience's imagination and everything up to yours.

2D Animation

Create killer effects by combining animation with real world video without annoying color conflicts.

Paint

Paint over your digital video or 2D animations all at once in glorious 24-bit Truecolor.

Synchronized Sound

Let your ideas speak by recording sound to your animations as you view them or by building animations to fit a pre-recorded soundtrack.

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Let Your PC Do the Walking

Have you been meaning to look up a long-lost colleague to find out about the latest hot business tip? If it's been a long time, chances are you're in for a tricky search. And if his or her name is a common one, you may simply be out of luck. But if the name is unusual, we found a program that just might be able to help you out.

Pro CD's Select Phone and Digital Directory Assistance's PhoneDisc PowerFinder '95 are sets of five CD-ROMs that try to provide access to every listed phone number in the United States. Sound too good to be true? Don't bet your Rolodex on it: Our tests suggest that these products are only about 60 percent accurate, which is still a step up from the 30 to 35 percent accuracy that was common four years ago.

A Degree of Accuracy To test these digital directories, we picked several names at random from the phone books of cities around the country. We also added more names given to us by people who live in small towns.

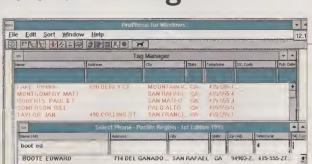
Of the 50 names on our list, Select Phone contained 26 and PhoneDisc PowerFinder contained 30. If neither directory provided a particular number, we checked with directory assistance. Three of the names on our list were unlisted or no longer valid according to directory assistance. Dropping these names gives the products an accuracy of 55 percent and 64 percent, respectively—impressive numbers but a far cry from the 95 percent accuracy that DDA claims for PhoneDisc PowerFinder.

Why the low accuracy? Since Americans typically relocate several times throughout their lives, phone numbers are not static. Even if you've lived in an area for the past 15 years, there's still a chance that you won't find yourself listed on these discs. In addition, neither product contains 100 percent of the nation's phone books yet. But both offer free quarterly updates, so your electronic directories can only get better.

Tough Choices Select Phone and PhoneDisc PowerFinder share common features such as indexing by name, phone number, and address, which makes for lightning-fast searches. And a license to use the data for direct-mail campaigns makes them incredible tools for many businesses.

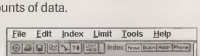
Select Phone includes a bare-bones version of MapLinx that locates zip codes, phone exchanges, and other information on a U.S. map; it will even search by zip code. Another handy features is a tag manager that lets you collect numbers, which is especially useful when performing complex searches. If you have a jukebox or multi-CD setup, Select Phone lets you search across several discs at once. The PhoneDisc PowerFinder interface, on the other hand, will find hits as you type them in, making your searches feel quite snappy.

Both products put tremendous power into the hands of businesspeople who need to track down prospects or lost customers. And home users will appreciate the opportunity to locate old friends. If you need the Tag Manager or MapLinx support, Select Phone is the product you should choose. Otherwise, PhoneDisc PowerFinder's slightly higher accuracy rate and a smooth interface that lets you scroll to hits make it our favorite between the two products. BARRY SIMON



Personal Phone Book: Select Phone's Tag Manager lets you collect information on several people within one dialog box as you're performing complex searches—a handy tool when you have to gather large amounts of data.

Quick Hits: PhoneDisc PowerFinder '95 eases searches by quickly scrolling to matching items.



FILEBOX

Select Phone

Usability ****
Technology ****
Verdict ****
Performs lightning-fast phone book searches.

System Requirements: 386 or faster, 4MB of RAM, 1.5MB of hard-disk space (an additional 7.5MB required for MapLinx), CD-ROM drive; Windows, DOS, and Macintosh versions.

Features: Indexed by name, address, and phone number; MapLinx for locating zip codes and other information.

Extras: Pro CD also makes Home Phone and Direct Phone, two-disc sets without address or phone indexes (Direct Phone includes business listings), Free Phone (a database of toll-free numbers), and Canada Phone.

$160 est. street price
Pro CD
(800) 992-3766, (508) 750-0000
Reader Service No. 678

PhoneDisc PowerFinder '95

Usability ****½
Technology ****
Verdict ****½
If only all phone books were this smart.

System Requirements: 386 or faster, 4MB of RAM, 200K of hard-disk space, CD-ROM drive; Windows, DOS, and Macintosh versions.

Features: Indexed by name, address, and phone number; scrolls through searches as you type them.

Extras: DDA also makes PhoneDisc Residential (two discs), PhoneDisc Business (one disc), and Combo Pack (Residential plus Business on three discs).

$150 est. street price
Digital Directory Assistance
(800) 284-8353, (817) 639-2900
Reader Service No. 679

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

Samsung monitors. Designed from your point of view.

SyncMaster™ 17GLi.

Today's applications demand more from your monitor. That's why Samsung created the GLi Series monitors. They work the way *you* do.

Performance is only part of the reason to buy a new 17-inch SyncMaster monitor. It has big, bright, crisp, clear images that you can depend on year after year.

Simplicity is also important. The GLi Series offers Plug and Play* compatibility, so you can get right to work. Its intuitive controls and on-screen programming keep concentration where it belongs – on the job.

Plus, Samsung delivers outstanding **Value** – in the comfort of a three-year warranty, and the satisfaction of a competitive price.

If you take your work seriously, think about an exceptional monitor. Think about the SyncMaster 17GLi. After all, it's your point of view.

Call 1-800-933-4110 or use fax-on-demand at 1-800-229-2239 for more information.

SyncMaster	15GLi	17GLi
Flat Square CRT	15"	17"
Dot Pitch	.28	.28
PC Compatibility	1280 x 1024@60Hz	1280 x 1024@60Hz
Mac Compatibility	1024 x 768@75Hz	1024 x 768@75Hz
Color Temperature Selection	•	•
UltraClear Coating™		•
Limited Warranty	3 Years	3 Years

Actual viewable areas are 14.0" (15GLi) and 16.0" (17GLi)

© 1995 Samsung Electronics America, Inc. SyncMaster™ and UltraClear Coating™ are trademarks of Samsung Electronics.
*When used with Windows 95™ or Plug and Play operating system conforming to VESA guidelines.
Use of the Energy Star logo is not considered to be a product endorsement

Circle 139 on reader service card.

SAMSUNG ELECTRONICS

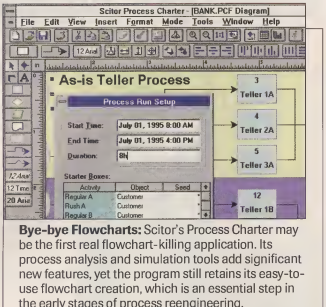
Flowcharts Come to Life

Two-dimensional boxes and arrows are fine for describing a process or diagram on paper, but wouldn't it be more useful if flowchart programs let you work with the data they depict? Now they do. Arcland's FlowModel and Scitor's Process Charter for Windows go beyond traditional diagramming tools by adding live data models to the process flow so you can work with a visual picture of your process *and* the underlying data.

Model Flowcharts At their core, FlowModel and Process Charter are flowchart programs, and they match the ease of use and functionality of the current crop of flowcharters. FlowModel comes with ten preinstalled templates that offer distinct sets of symbols for networks, org charts, PERT charts, and process charts. You can also add your own.

FlowModel makes diagramming easy with snap-to-grid shapes and intelligent line routing as well as drag-and-drop and point-and-click functions that let you arrange shapes in seconds. Text formatting is standard, but since the text boxes don't expand automatically, you must resize box sizes to accommodate more text.

Once you've drawn a complex process chart, you don't want to start from scratch again whenever there's a change. Recognizing this, FlowModel lets you link data with symbols and connectors so that you can export costs, work cycles, and other project-oriented variables to your spreadsheet or database as ASCII text. You can also import newly revised data back into FlowModel to update your diagram and exchange data with most popular spreadsheets and databases, including Excel, Access, Approach, 1-2-3, and dBASE. But users unfamiliar with databases will need some hand-holding, and there's no simulation built in (though you can export your data table to a third-party package).



Bye-bye Flowcharts: Scitor's Process Charter may be the first real flowchart-killing application. Its process analysis and simulation tools add significant new features, yet the program still retains its easy-to-use flowchart creation, which is an essential step in the early stages of process reengineering.

System Analysis: FlowModel lets you analyze and manipulate flowcharts using a diagrammer and a database model. All of the shapes and connectors can be linked to exportable text in spreadsheet format.

Charting Your Process Process Charter takes process management features several steps further than FlowModel by handling resource management and simulations. This is a whole new ball game, but the basics are still here. You set your "mode" (Select, Figure, Line, Text) and manipulate shapes, lines, fills, and text with plenty of customization, additions, and attribute control. There aren't the same kinds of predesigned templates that FlowModel offers, but you can create a master page, and the text handling is more flexible.

The most profound interface change involves multiple views: You choose from diagram, spreadsheet, or graph, and the data is automatically rendered in a chart or graph. In the spreadsheet view you assign values to such project management variables as time, priority, and resources, thereby ensuring that you have complete control over every factor in your workflow.

And here's the big payoff: Process Charter lets you animate simulations to illustrate the time and costs associated with a process. You can go back to examine a specific value to see if you've identified a bottleneck. A bar graph—rendered from your flowchart and/or spreadsheet—illustrates the process, and you click on parts of the legend or bars to see different results. Activity statistics are also available in spreadsheet form, and plenty of handy "extras" let you really dig into your process and experiment with what-if scenarios.

Flowcharters abound, but most focus on the easy creation of 2-D paper drawings. FlowModel does all of them one better by letting you associate data with symbols and connector links, but Process Charter is the only one with built-in features for animated simulation. **JAMES OLIVER CURY**

FILEBOX

FlowModel

Usability ★★★½
Technology ★★★★
Verdict ★★★½
Exportable data modeling at a reasonable price.

Competition: Micrografx's ABC FlowCharter 4.0, Corel's CorelFlow 2.0, and Banner Blue's Org Plus 3.0 focus on ease of use, and Visio 3.0 adds great drawing features.

$299 est. street price
Arcland
(800) 873-2249
Reader Service No. 680

Process Charter for Windows

Usability ★★★★
Technology ★★★★★
Verdict ★★★★½
Groundbreaking process management and analysis.

Competition: CFM's TeamFlow adds project management, and Clear Software's allClear III for Windows offers text control.

$475 est. street price
Scitor Corp.
(800) 549-9876
Reader Service No. 681

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Which Database is Easier to Use?

Access vs. Alpha Five

60 Lines of Code

Microsoft Access

If this looks tough, you may want to pick up a few books about Access programming.

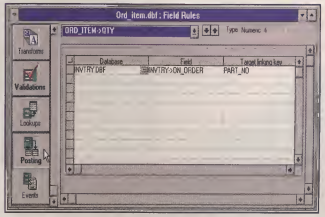
```
Sub Form_AfterUpdate ()
  Dim varRet As Variant
  Dim lngNewItemID As Long
  Dim dblNewQuantity As Double
  Dim qdfInventory As QueryDef
  Dim dbCurrent As Database
  Dim rstInventory As Recordset
  Dim intResponse As Integer
  Dim strMessage As String
  Const MB_YESNO = 4
  Const MB_ICONQUERY = 32
  Const MB_DEFBUTTON2 = 256
  Const ID_YES = 6
  Const ID_NO = 7
  Set dbCurrent= dbEngine.Workspaces(0).Databases(0)
' First, renumber any order lines that have changed
  varRet = RenumberDetail()
' Now, deal with inventory problems
' First, get the new item and quantity for this line
  lngNewItemID = Me![ItemID]
  dblNewQuantity = Me![Quantity]
' To update the inventory,
'  first, run the query to add the old items back in
'  then, run the query to remove the new items
  Set qdfInventory = dbCurrent.OpenQueryDef("qupdAddIngredientsForItem")
  qdfInventory.Parameters(0) = dblQuantity
  qdfInventory.Parameters(1) = lngItemID
  qdfInventory.Execute
  qdfInventory.Close
  Set qdfInventory = dbCurrent.OpenQueryDef("qupdRemoveIngredientsForItem")
  qdfInventory.Parameters(0) = dblNewQuantity
  qdfInventory.Parameters(1) = lngNewItemID
  qdfInventory.Execute
  qdfInventory.Close
' Now, have we run out of stock on anything?
  Set rstInventory = dbCurrent.OpenRecordset("qryExhaustedIngredients", DB_OPEN_SNAP
    SHOT)
  'If there are any records here, we've got a problem
    If Not rstInventory.EOF Then
      Do While Not rstInventory.EOF
        strMessage = "Warning! Out of stock on " & rstInventory![Description] & ".
        Continue?"
        intResponse = MsgBox(strMessage, MB_YESNO + MB_ICON QUERY
            + MB_DEFBUTTON2,
                "Inventory Warning")
                If intResponse = ID_NO Then
                  'Go back to original values and pass up the rest of the
                  recordset
                    Me![ItemID] = lngItemID
                    Me![Quantity] = dblQuantity
                    'Remember to reverse the changes
                    Set qdfInventory =
                    Current.OpenQueryDef
                        ("qupdAddIngredientsForItem")
                    qdfInventory.Parameters(0) = dblNewQuantity
                    qdfInventory.Parameters(1) = lngNewItemID
                    qdfInventory.Execute
                    qdfInventory.Close
                    Set qdfInventory =
                    dbCurrent.OpenQueryDef
                        ("qupdRemoveIngredientsForItem")
                    qdfInventory.Parameters(0) = dblQuantity
                    qdfInventory.Parameters(1) = lngItemID
                    qdfInventory.Execute
                    qdfInventory.Close
                    rstInventory.MoveLast
                  Exit Do
                End If rstInventory.MoveNext
                          Loop
                        End If
                      rstInventory.Close
                      dbCurrent.Close
                    End Sub
```

Source: Microsoft Access Advanced Programming Seminar & Application Developers Training Company

One Easy Table

Alpha Five

Just fill in the table. That's all there is to it!



See how easy it is to accomplish the same task in Alpha Five.

Compare how Alpha Five and Access both perform order entry with live inventory updates. This is just one example of how Alpha Five is the only database that truly delivers on the promise of power and ease of use. If your time is valuable, try Alpha Five. Alpha Five is available at your local reseller. Or, call us for a FREE trial Alpha Five ($9.95 shipping and handling fee).

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© 1995 Intel Corporation. †Source: iCOMP®: A Simplified Measure Of Relative Microprocessor Performance. Intel Corporation, 1992. ††The 63-MHz Pentium OverDrive processor for most 50-MHz and 25-MHz Intel486™CPU-based systems is available no
The 83-MHz Pentium OverDrive processor for most 66-MHz and 33-MHz Intel486 CPU-based systems will be available later in the year. *Other trade names referenced are the property of their respective holders

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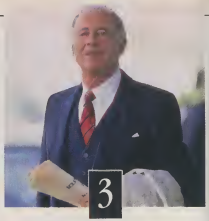

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Since NAFTA went into effect, I've been expanding my business into Mexico. Using Power Translator I've established new distributor relationships in Mexico City. And by customizing the dictionary, I only had to enter specialized business terms once! Although I still use professional translators for contracts and legal documents, Power Translator helps me understand the basic stuff in Spanish right from the start.

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Circle 241 on reader service card.

Sharevision PC3000

Face-to-Face Phone Conferencing

Desktop videoconferencing is one of those technologies that looks great on paper but has failed to make any significant inroads into the PC marketplace. Until recently the problem was due to bandwidth—PC modem technology is only now becoming adequate for real-time video transmission. But even with the advent of ultrafast V.34 modems, desktop videoconferencing has continued to languish due to a lack of simple and inexpensive shrink-wrapped solutions. Fortunately that's about to change.

With the introduction of its Sharevision PC3000 desktop videoconferencing system, Creative Labs is making a statement: Desktop conferencing isn't hard. In fact, the Sharevision PC3000 system is so easy to set up that you may wonder what all the fuss was about. Even better, it's the only product that runs over standard analog telephone lines, thereby avoiding the hassles and steep price tag associated with ISDN-based setups.

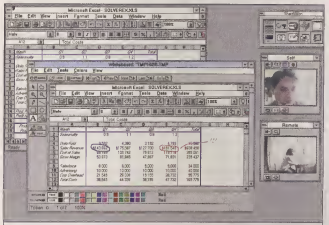
Soup to Nuts Everything you need for videoconferencing is right in the box, from the real-time video editing board to a V.Fast Class modem. Software, hardware, cables—it's a complete solution.

The core of this system is the Video Blaster RT300 editing board, which handles up to three RCA and one S-Video input channels. The Sharevision digital camera delivers good contrast even in dimly lit environments such as office cubicles, but don't expect movie-quality motion video. Even at Sharevision's maximum speed of 15 frames per second the video has a flipbook jerkiness to it, though it's good enough to convey facial expressions. And since higher frame rates require the expensive headaches of ISDN-based products such as AT&T's Vistium or Intel's ProShare, you can get used to Sharevision in a hurry. In addition, its video windows are sizable to 80 by 96 pixels, 96 by 128 pixels, or 120 by 160 pixels, though the video quality drops as the windows get larger.

The software is extremely easy to learn—most options are available via the tool palette, including a dialer program you use to manipulate the modem and establish connections.

Share with Others Once connected, you can collaborate visually via a real time interactive whiteboard, share an application in real time with each authorized user, and move data from system to system via a custom file transfer program. Best of all, you get a fully functional 28.8Kbps V.Fast Class modem (Creative Labs throws in a copy of Delrina's WinFax Lite to emphasize the point). This makes the Sharevision PC3000 system particularly attractive to small businesses and home offices looking for a low-cost communications solution. Even the digital camera can become an interesting diversion since Sharevision lets you capture full-color still images and save them to disk.

Overall, the Sharevision PC3000 system is an example of a good idea well executed. True to its reputation as the master of bundled functionality, Creative Labs includes everything you could possibly need in the Sharevision box. It's a complete desktop videoconferencing solution that works across standard phone lines. RANDALL C. KENNEDY



Why Travel? Have face-to-face meetings right at your desk with videoconferencing. If you're looking for an inexpensive, easy-to-use setup, check out Creative Labs' Sharevision PC3000. The video quality isn't as good as ISDN's, but it's far easier to install and works across standard phone lines.

Video Phone: The Sharevision PC3000 is videoconferencing the easy way. It includes a video card, color camera, sound card, 28.8Kbps modem, and headset.

FILEBOX

Sharevision PC3000

Usability	****
Performance	***½
Technology	****
Verdict	****

An economical videoconferencing solution.

Competition: There are various component offerings from other desktop videoconferencing vendors, but no other product supports conferencing across standard phone lines.

Minimum System Requirements: 486, 8MB of RAM, 6MB of available hard-disk space, Windows 3.1, two available ISA expansion slots; a 16- or 24-bit SVGA card is recommended.

Includes: Video compression card, color camera, audio card, 28.8Kbps voice and data modem, microphone, headset, and software.

$1,400 est. street price
Creative Labs
(800) 998-5227, (408) 428-6600
Reader Service No. 688

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

PHOTOGRAPH BY ARNOLD TADIO

No Place Like Your Own Home Page

SNEAK PREVIEW

If you surf the unending waves of hypertext-linked home pages on the Web, sooner or later you'll want to contribute your own work to the world's largest vanity press. With Microsoft Internet Assistant and Novell's WordPerfect Internet Publisher, the most popular business applications meet the most popular online application in an easy-to-use Web publishing format.

Web pages are written in HyperText Markup Language (HTML), which is a relatively arcane coding language. There are other HTML authoring programs (see "Internet Publishing Made Easy," December 1994, page 111), but they don't hide that unfriendly HTML code. Microsoft Internet Assistant and WordPerfect Internet Publisher get around this problem by adding HTML authoring to your word processor, an application that's been hiding formatting codes for years.

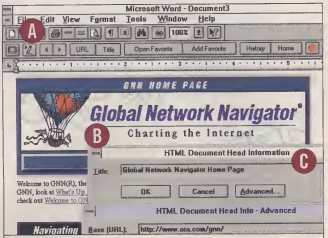
Instant Publishing These two free add-ons are basically style sheets, complete with their own toolbars and specialty menus. In both programs you can begin an HTML document from scratch by choosing New from the File menu, or you can convert an existing document to HTML.

Microsoft Internet Assistant acts as both an authoring tool and a Web browser. As a Web browser it's useful but hardly a substitute for Mosaic, Netscape Navigator, or InternetWorks. It's slow, and its features are rudimentary. But it does let you find home pages you like and use them as a starting point for authoring your own.

WordPerfect Internet Publisher isn't a Web browser, but it comes with Netscape Navigator and viewers for WordPerfect and Envoy. This is significant because it means you don't have to convert your documents to HTML for Netscape Navigator to display them. However, you will have to convert them if you want other browsers to see them (at least for now). Fortunately WordPerfect Internet Publisher makes this conversion easy. Novell also offers Internet Publisher Pro, which comes with TCP/IP tools, trial subscriptions to a number of Internet providers, and the Standard Generalized Markup Language (SGML) edition of WordPerfect for Windows (for serious Web designers only).

Pressing Limits Both programs support HTML 2.0, but they do so in a limited fashion. This means that with Microsoft Internet Assistant some word processor formatting will not convert to HTML, including annotations, borders, and tabs. However, it features a few unique HTML tricks such as text wrap around graphics. Because WordPerfect Internet Publisher ships with Netscape Navigator, it supports cutting-edge features like tables and backgrounds that have been proposed within HTML 3.0.

If you have Word or WordPerfect, use Microsoft Internet Assistant or WordPerfect Internet Publisher for your Web authoring. You won't find an easier initiation into the world of HTML. NEIL RANDALL

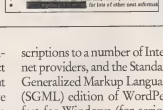


Digital Gutenberg: Web publishing is as close as your word processor with HTML authors like Microsoft Internet Assistant (pictured here) and WordPerfect Internet Publisher. Create sophisticated hyperlinks, build your own Web page from scratch, or convert word processing documents to HTML.

A. Microsoft Internet Assistant, a free add-on, transforms your typical Word toolbar into an **HTML browser/editor toolbar.**

B. Built in is a basic but utilitarian **Web browser** for scouting out desirable home pages.

C. You can track HTML home pages using the **history lists.**



FILEBOX

Microsoft Internet Assistant

Usability ***
Technology ***½
Verdict ***½
If you're a Word user who wants to write HTML, this is the place to start.

Competition: Quarterdeck WebAuthor also integrates seamlessly with Word, but it costs $149.

Software Requirements: Microsoft Word 6.0.

Free
(http://www.microsoft.com)
Microsoft
(800) 426-9400, (206) 882-8080
Reader Service No. 689

WordPerfect Internet Publisher

Usability ***
Technology ****
Verdict ***½
If you're a WordPerfect maven, here's one for the future that's here now.

Competition: There are many other HTML editors, but none is an exclusive component of WordPerfect.

Software Requirements: WordPerfect 6.1.

Free
(http://www.novell.com)
Novell
(800) 453-1267, (801) 429-7000
Reader Service No. 690

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

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Photo Credit: Tom Vendetti

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Max Resol.	1280 x 1024 @ up to 66Hz
Standards	MPR-II, TCO

F2·17

Dot Pitch	0.28mm
Scan Freq.	H:30-69kHz, V:55-120kHz
Rec. Resol.	1024 x 768 @ up to 87Hz
Max Resol.	1280 x 1024 @ up to 66Hz
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Logbook LONG-TERM TESTS: OmniBook 4000 • WinFax Pro 4.0

On the Road, Feeling Fine

As convenient as portables are, I've never enjoyed traveling with one. Sure, it's great to dial in and check e-mail, and it's far more satisfying to get work done rather than sit idle on an airplane. But somehow working on the road has always been easier said than done for me.

Then I started traveling with Hewlett-Packard's OmniBook 4000. The things I love about it—the big, clear color screen, fast 100MHz DX4 processor, comfy keyboard, and long-lasting battery—made me realize why I've never been able to effectively work with other portable systems. me on a recent flight from San Francisco to Boston. Granted I didn't work the entire flight, but I wrote a letter, started a review, played some Hearts, and turned off the system before it shut itself down. Now that's the type of portable (and battery) that helps me maximize my time.

One thing does drive me nuts about the OmniBook: the placement of the Home key in relation to the Backspace key (common on notebooks). When I make a mistake on my desktop PC, my hand zips up to the right-hand corner, deletes the letters in question, and I'm typing again before I even know what my hand has done. But with the OmniBook I accidentally hit the Home key about 60 percent of the time. Then I'm typing corrections at the beginning of a line, and I really mess myself up.

But minor points like that won't keep me from using the OmniBook 4000 when I'm traveling. And I like the feel of the keyboard otherwise. Now if they would only make those airplane seats a little more comfortable!

KYLA K. CARLSON

OmniBook 4000 / Hewlett-Packard / (800) 752-1264 /

Logbook Entries:

March 27, 1995: *Road trip. . . . If this guy in front of me didn't have his darn seat so far back, I might be able to work in comfort. Fortunately I can still see my big active-matrix color screen.*

March 28, 1995: *Voilà! My PC Card modem is plugged in and working like a charm.*

April 10, 1995: *HP's LaserJet 5P and this notebook are a great pair. With fancy new JetEye drivers and infrared ports on both products, I'm beaming documents to my printer without cables.*

May 5, 1995: *I'm annoyed with the placement of the Backspace and Home keys because I make a new mistake every time I backspace to correct myself. (Guess I'll have to relearn how to type.)*

PC Computing

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On the Road, Feeling Fine

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OmniBook 4000 / Hewlett-Packard / (800) 443-1254 / $3,299 est. street price / *Reader Service No. 691*

Logbook Entries:

March 27, 1995: *Road trip. . . . If this guy in front of me didn't have his darn seat so far back, I might be able to work in comfort. Fortunately I can still see my big active-matrix color screen.*

March 28, 1995: *Voilà! My PC Card modem is plugged in and working like a charm.*

April 10, 1995: *HP's LaserJet 5P and this notebook are a great pair. With fancy new JetEye drivers and infrared ports on both products, I'm beaming documents to my printer without cables.*

May 5, 1995: *I'm annoyed with the placement of the Backspace and Home keys because I make a new mistake every time I backspace to correct myself. (Guess I'll have to relearn how to type.)*

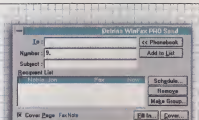
Logbook Entries:

February 17, 1995: *Installation over the old version is easy. I install WinFax Pro 4.0 on my local drive, and it finds my Version 3.0 phone books on the network drive. It also reassuringly notifies me that the phone books will be linked to the new version.*

March 14, 1995: *I can fax documents directly from Microsoft Excel.*

March 15, 1995: *When I fax from within the application, it resets the printer to the WinFax driver so that I have to go back and change it. It's easier to attach the spreadsheet in WinFax.*

April 21, 1995: *All the new fields in the phone book make me wonder who needs PIMs after all.*



Fax to the Max

Why did I wait so long to upgrade to WinFax Pro 4.0? I suppose I'm a little sentimental. After all, Version 3.0 had supported me through a million faxes and continued to send my documents throughout the night, long after I had gone home. Or maybe I thought the new version couldn't be much better, so why bother to upgrade? Well, Version 4.0 is better, and it's just as dependable as my old WinFax Pro. In fact, the more I use it, the more I wonder how I managed without it.

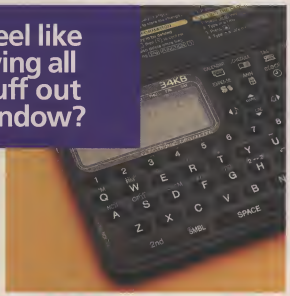
First, there's the whole new look and feel. When I'm sending a fax, I can now see everything in one view: blank cover sheet, phone book, attachments, and controls to change the send options on the fly. It runs faster, too: Version 3.0 seemed a bit sluggish, but Version 4.0 zips along. No more waiting for the phone books to open, for the fax to receive data, or even for the program itself to open (maybe I don't need that Pentium after all). When I installed the new version, all phone book data was automatically linked, which was a relief. However, I did have to manually add my customized cover sheets.

A new time-saver in WinFax Pro lets me access my files—regardless of their origin or where they're stored—and attach them directly to faxes. This alone is reason to upgrade. It sure beats having to print a file to the WinFax driver in order to create an attachment. I can't believe I used to settle for so much less. **LIESL LA GRANGE**

WinFax Pro 4.0 / Delrina Corp. / (800) 268-6082 / $129 est. street price / *Reader Service No. 692*

PHOTOGRAPHY BY ARNOLD TOSTESON

Ever feel like throwing all this stuff out the window?



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Go right ahead.

Sound BLASTER

Go on, throw out the fax machine, speaker phone, answering machine, modem, and address book. Now all you need is Phone Blaster and the trusty PC you already own.

Introducing Phone Blaster.

Phone Blaster plugs the latest communications technology into your desktop computer. As a fax center, it can send, receive, schedule, and store your files. It even broadcasts or forwards fax-on-demand documents. As a voice messaging center, it identifies callers, records voice mail, calls your pager, and plays greetings or music on hold. And it's got software to help organize your contacts as well.

It's an unbeatable combination of a quick 14.4K bps fax/modem, Sound Blaster 16-bit audio, and Ancilla integrated telephone management software. Plus, there are free trial memberships to the coolest online services. And after hours, it turns your business computer into an awesome multimedia system. It's the easiest way to move your small or home office into the future.

Of course, you could spend more than $1,000 on other equipment to do all that. But then, all you need is a $299 Phone Blaster. Call 1-800-998-5227 Ext. 113. Or visit your nearest Creative Labs dealer.

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WELCOME TO CRESTE

SKI SCHOOL. YOUR FIRST EXERCISE FOR TODAY IS TO

Next: a black diamond run. And why not? After a Microsoft® PowerPoint® 4.0 presentation, anything seems possible.

That's just the way Marni Joslyn, head instructor of the Never Ever Ski School, wants it. After all, her job is to convince every stumbling, wobbly-kneed, double left-footed beginner that he can make it down the mountain. (And you think you've got it tough.)

Not surprisingly, before Marni brings her students to the mountain, she brings the mountain to her students. With PowerPoint 4.0, the leading presentation graphics software.

Since Marni's familiar with the Microsoft Office family of applications, she's already familiar with PowerPoint's menus and toolbars. This makes getting started and navigating her way around as easy as getting down the bunny slope.

How can she put such persuasive presentations together?

Simple. First, she clicks into AutoContent Wizard, which helps her organize and outline her overall presentation thoughts and even offers tips on content.

Next step, she clicks into AutoLayout Gallery and chooses a slide layout from the more than 20 options available.

As if that wasn't easy enough, there's the handy Pick A Look Wizard to help her create the right look for her presentation. In short, PowerPoint 4.0 helps Marni perform like a true professional.

As Marni is often heard telling her students, practice ma perfect. Fortunately, the Rehearsal feature allows her to just that—practice, practice, so she never hav worry about falling flat in front of her class.

What really makes Marni content at the end of the d the power to take her students up that imaginary moun and see them safely down again. (The only bruises the stude

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Outside the U.S. and Canada, call your local Microsoft subsidiary or (206) 936-8661. Customers who are deaf or hard-of-hearing can reach Microsoft text telephone (TT/TDD) se

BUTTE

YOUR MIND.

have to show for their exhilarating descent are imaginary.)

For such a feat, she certainly deserves an award. Microsoft PowerPoint 4.0 has already won its fair share, eight of the industry's most prestigious.

Everyone has his own mountain to face. PowerPoint 4.0 can help you to face yours. Don't be afraid. Call (800) 240-4782, Department XQP for more information.

In the meantime, welcome to the great indoors. Gulp.

Microsoft

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Windows license (Server and software must be acquired separately) For information only in the 50 United States, call (800) 240-4782, Dept XQP. In Canada call (800) 563-9048 (TTY) (800) 892-5234 in the U.S. or (905) 568-9641 in Canada. Microsoft and PowerPoint are registered trademarks and Where do you want to go today? is a trademark of Microsoft Corporation.

One-Click Internet

SYNOPSIS

NETCOM NETCRUISER: *Low usability scores overall.* **116**

PIPELINE NEW YORK: *Most usable e-mail, other good features.* **117**

PRODIGY: *Web browser extraordinaire.* **118**

PSI INTERRAMP: *Usable e-mail, but weak elsewhere.* **119**

SPRY INTERNET IN A BOX: *Strong all-around product.* **120**

USABILITY RESULTS: *How the products compare.* **122**

FINAL ANALYSIS: *Key considerations.* **124**

DECISION MAKER: *Choose the solution that best meets your needs.* **124**

Sure you want on. You've resisted the Internet long enough. But you think it's too hard, too slow, and too expensive. A lot of companies out there are promising one-click solutions, but you're skeptical. So we called their bluff. We brought the top contenders into *PC Computing*'s Usability Labs and put them through the wringer. The best packages require you to do nothing more than enter your credit card number—the product does all the setup and dialing for you. Five of the top products offering software with their services are NetCom's NetCruiser, Pipeline New York, Prodigy, PSI's InterRamp, and Spry's Internet in a Box.

All are relatively easy to install. But what is it like to use them? We brought the products into the *PC Computing* Usability Labs to find out. Our usability testers—selected because they use a major online service at least weekly—read and sent e-mail, browsed the World Wide Web, located and transferred files, and read some Internet newsgroups.

The truth is, the Internet is a usability throwback. No single package was a standout in all the tasks. In fact, none of the products was consistently good enough to earn our *PC Computing* Usability Seal of Approval. A product that was good at one or two tasks was inevitably weaker at others.

What does all this mean from your side of the modem connection? If you want mail, select Pipeline New York; for a Web browser, choose Prodigy; for file transfers, Spry's Internet in a Box, Pipeline New York, or Prodigy will all work; and accessing Internet newsgroups is easiest from Internet in a Box.

As Net connect packages go, one size clearly does not fit all. Before you purchase one, be sure to consider the key reasons you access the Internet and whether you have any special requirements (for example, Pipeline New York is a great resource if you live in New York), then select the product that best matches your needs.

A E-MAIL POWER: Pipeline New York's interface provides the most usable e-mail component of all the packages we evaluated—particularly if you're dialing in from New York.

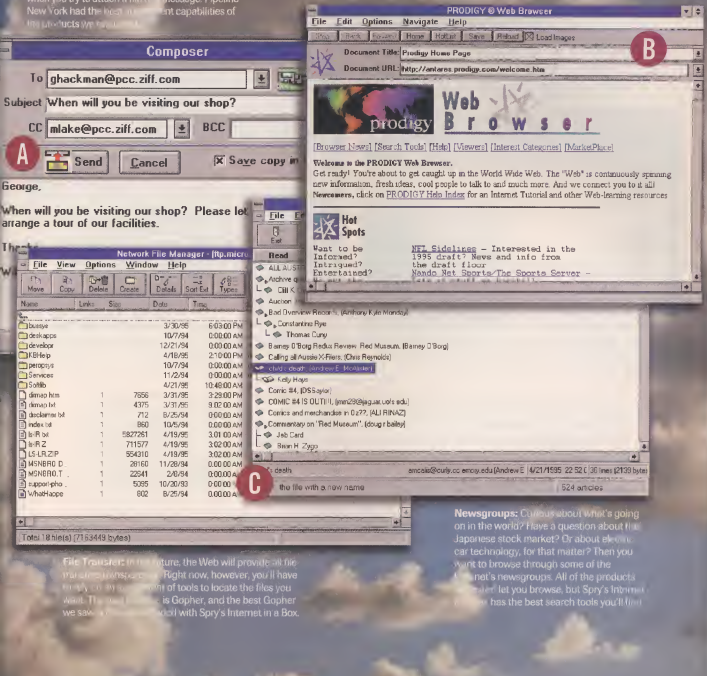
B WEB WONDER: Prodigy's well-designed home page and Mosaic-like browser make searching the World Wide Web for information a breeze.

C GOOD NEWS: Spry's Internet in a Box includes the most capable—and elegant—Internet news reader of the products we evaluated.

BY GEORGE HACKMAN JR. AND JOHN MONTGOMERY

E-mail: For most of us, the Internet's No. 1 use is still e-mail. Most Internet access packages have no problem with simple text messages, but things get complicated when you try to attach a file to a message. Pipeline New York had the least [illegible] capabilities of the products we tested.

World Wide Web: A graphical interface to the Internet's power, the Web is a vast [illegible] of ink-on-disk—which can gobble [illegible] of time as you surf through it. To find a specific [illegible] during hours, turn [illegible] for [illegible] off-hours [illegible].



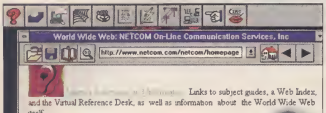
File Transfer: In the future, the Web will provide all file transfers/downloads. Right now, however, you'll have to rely on a variety of tools to locate the files you want. The best [illegible] is Gopher, and the best Gopher we saw [illegible] with Spry's Internet in a Box.

Newsgroups: Curious about what's going on in the world? Have a question about the Japanese stock market? Or about electric car technology, for that matter? Then you want to browse through some of the Internet's newsgroups. All of the products [illegible] let you browse, but Spry's Internet [illegible] has the best search tools you'll find.

NetCruiser: Mixed Usability Bag

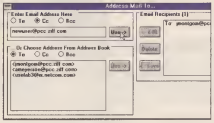
With people, first impressions are important. With software, it's the second, third, and fourth impressions that will win you over. Put simply, NetCom's NetCruiser 1.52 makes a less-than-wonderful second impression. Installation was a snap, which raised our expectations, but our testing showed that ease of installation had little to do with NetCruiser's actual usability. NetCruiser scored at or near the bottom in usability rankings in each of the four tasks we tested.

At first blush, the interface certainly *seems* friendly. There are icons along the top of the screen for major functions such as e-mail, ftp, gopher searches, World Wide Web access, Internet "chat," and reading and posting to Internet newsgroups.



Search for Search Tools: Scouring for information on the Internet—and especially on the World Wide Web—isn't made easier with NetCruiser. Unlike many of the front ends we evaluated, there are no built-in links to search engines directly from NetCom's home page.

Map to ftp: NetCruiser includes a geographic map to ftp sites, but ftp sites aren't arranged geographically.



Proper Addressing: Instead of letting you type an e-mail address, NetCruiser forces you use its address book.

Once our usability testers delved into the interface, however, frustration set in. They found, for example, that they were unable to figure out how to attach binary files to e-mail messages. Worse, they couldn't enter an e-mail address directly—they had to first click on the address button, enter the address and name of the recipient, and go through a few other hoops before they could finally send the message.

Similarly, accessing the Web worked well when testers had the uniform resource locator (URL) of the page they wanted. But when they had to search, Web search tools were sparse.

Transferring files with NetCruiser's ftp was a mixed bag. NetCruiser's ftp application works more or less like Windows' File Manager. It's well designed if you know exactly where you're going. When you have to search, however, you have to drop out of the file transfer, then use Archie or one of the search tools on the Web. There is no search tool built into the program.

Similarly, searching through Internet newsgroups also earned medium to low marks from testers.

Despite an initially attractive interface and all the basic functionality, NetCruiser's usability needs work. A good start: Supply a set of easy-to-find search tools.

NetCruiser 1.52 / NetCom On-Line Communication Services / (800) 501-8649, (408) 345-2600 / $19.95 per month, $25 startup fee / *Reader Service No. 741*

Lab Notes

Usability testers had difficulty dealing with most features of NetCruiser. In particular, locating places on the Net was a chore.

What Testers Said about NetCruiser

"Ftp itself worked without too much trouble, but finding the file to get was hard if you didn't already know its location."
PHOTOGRAPHER

"It's hard to read in a 4-inch window when you may have to browse hundreds of [Internet newsgroup] entries."
CHEMICAL ENGINEER

"I had difficulty using the Web, and the available help didn't give me any hints."
PC CONSULTANT

TESTLAB SUMMARY

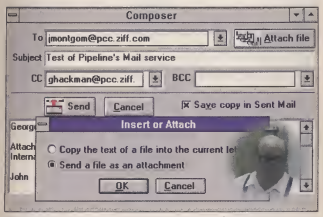
	E-mail	Web Access	File Transfer	Newsgroups
Satisfaction	Well, it looks nice.	Frustration sets in.	What's with the map?	Too much info in a tiny window.
Productivity	Most tasks completed.	Finding data is hard.	Search is a separate application.	Searches are a problem.
Help System	You're on your own.	No information on searching.	Adequate.	Covers most questions.
Verdict	★★★	★★½	★★½	★★½

★★★★★Excellent ★★★★Good ★★★Acceptable ★★Poor ★Unacceptable

Pipeline: The Most Usable E-mail

Pipeline: It's a New York thing. Its interface is so slick, however, that many outsiders have become interested. If you're outside the Big Apple's greater Metro area, you'll be looking at a long-distance call to connect, but it may be worth it: Pipeline scored well in our usability tests—not well enough to win our Usability Seal of Approval, but it tied for the top score.

Novice users will appreciate the clearly marked features and push-buttons for mail commands. Even advanced functions such as attaching binary files are as simple as clicking on Attach File, then selecting the file. Pipeline automatically encodes the file. No other app we tested made this type of operation nearly as easy.



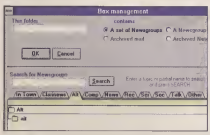
Easy Mail: Pipeline provided the most usable mail capabilities. In particular, testers lauded the ease with which you can attach a binary file—the software automatically takes care of encoding so the file can go over the Net.

Locating information on the Web with Pipeline proved easy if you have the URL—which is not surprising. But usability testers found the Web search tools for finding information far more difficult to use.

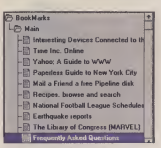
The same is true for downloading, which looks simple at first. When you select ftp, Pipeline gives you a window where you can enter the ftp site, filename, or both. The benefit? If you don't know where the file is located, Archie can find it based on the filename.

However, testers found that when you supply both the site and file names—and either is incorrect—the software gives every indication that it's downloading the file (including a status indicator), but doesn't. When you open the file, it's empty. Very mysterious.

Usability stumbles when you try to find information in Internet newsgroups. Almost none of our usability testers was able to find the search engine—it's buried under a button in the Add Newsgroup window. Once you find the search tool, however, it's quite effective, thanks to options for searching by newsgroup or by partial topic names.



No News Is Good News? Searching Internet newsgroups wasn't difficult, but finding the proper search tool was.



Where Am I? Many testers found that Pipeline's bookmarks made it easy to locate information.

In all, Pipeline's interface and service provided are among the better we tested, although they could still stand some work. All things considered, if you live in the New York area, Pipeline is a fine choice.

Pipeline New York Software 2.0.8 for Windows / PSINet/Pipeline / (212) 267-3636 / Software is free; $19.95 per month unlimited access or $9.95 per month for 5 hours of access time / *Reader Service No. 742*

Lab Notes

Pipeline New York's e-mail won kudos, but testers found the documentation was lacking.

What Testers Said about Pipeline

"[Finding information on the Web] was difficult but I did muddle through. Help wasn't helpful and there was no manual to check."
SEMICONDUCTOR MECHANIC

"As a beginner, I found it difficult [to search newsgroups] because the documentation wasn't designed for quick help."
SOFTWARE ENGINEER

"The icon to attach a file was prominent, and the verification that the file was actually attached was clearly visible."
CHEMICAL ENGINEER

TESTED SUMMARY

	E-mail	Web Access	File Transfer	Newsgroups
Satisfaction	Seems that everybody likes it.	There's a learning curve.	Need the file's exact name or location.	Hard to find the search engine.
Productivity	All of the jobs get done.	Uses the Internet's raw tools.	Easy access to Archie.	Once you find the search engine, it works.
Help System	You won't need it.	Not much help was available.	Help system doesn't help.	Most answers are there.
Verdict	★★★★½	★★★	★★★	★★½

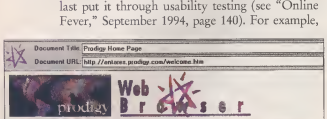
★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Reviews: Prodigy and Performance Systems' InterRamp

Prodigy: Best for Browsing

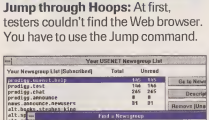
Prodigy is . . . . Well, let's say that its interface looks a bit different from the other products we evaluated. Less kind souls might describe it as ugly. Despite diverging aesthetic opinions, however, usability testers found that Prodigy got the job done. It tied for the top score in our usability evaluation, although not high enough to win *PC Computing*'s Usability Seal of Approval.

Prodigy's e-mail interface has improved since we last put it through usability testing (see "Online Fever," September 1994, page 140). For example, you can now enter an e-mail address directly without including a confusing Prodigy prefix. But mail still has an unattractive character-based interface. In Prodigy's defense, you can purchase a $15 add-on that should increase the power of this interface, and an entirely new e-mail interface is promised for Prodigy's next release, which should be available by the time you read this.



Great Browser: Prodigy's Web Browser looks a lot like Mosaic, the original graphical Web browser. By creating an excellent home page with a page rich array of links, Prodigy's version makes finding information very easy. Usability testers liked what they saw.

Jump through Hoops: At first, testers couldn't find the Web browser. You have to use the Jump command.



Search and Find: Usability testers liked Prodigy's news reader, and the search tools are among the best.

Lab Notes

Searching the Web is easy, but using Prodigy's ftp features proved frustrating.

What Testers Said about Prodigy

"The [Web] search tools made it a pleasure to seek out subjects."
FIELD SERVICE ENGINEER

"[Downloading files] is easy if you know how to enter the URL in the Web browser. For ftp, Prodigy requires a prefix on the URL line, and the manual isn't very helpful."
SOFTWARE ENGINEER

"[Finding files is] a real pain. The software didn't provide any clues as to how or where to look."
PHOTOGRAPHER

Prodigy is a solid product despite some quirks, including an interface that may initially seem unattractive. But you can't judge a book by its cover, and Prodigy was one of the most usable products we tested.

Prodigy / Prodigy Services / (800) 776-3449 / $9.95 per month, including 5 hours of connect time; $2.95 per additional hour / *Reader Service No. 743*

SUMMARY

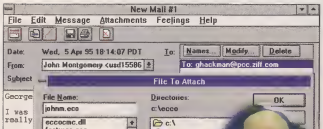
	E-mail	Web Access	File Transfer	Newsgroups
Satisfaction	The e-mail interface isn't glitzy.	Mosaic-like browser is first-rate.	Slick Web interface.	Good search tools.
Productivity	Gets the job done.	Great search tools.	A little hard to find.	Great thread-tracking.
Help System	Fortunately, you won't need it.	No help needed.	Help is wanting.	Again, the help files are useless.
Verdict	★★★★	★★★½	★★★	★★½

★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

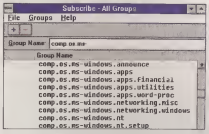
InterRamp: High E-mail Usability

PSI's InterRamp seems to have all the right moves—a pretty interface, many local access points, a good networking foundation—but as far as usability goes, it stumbles. Its mail interface drew high marks, but the Web browser, ftp capabilities, and newsgroup reader consistently tripped up testers.

Testers were able to complete all e-mail assignments, which gave the product a perfect score. Testers liked the clear placement of the option for adding binary files to e-mail messages. Even better, InterRamp automatically encrypts the attachments.



Solid E-mail: Attaching files to e-mail messages with InterRamp is a snap: simply select Attachments and choose your file. The interface, on the other hand, drew mixed reviews. Testers were able to complete all the tasks without resorting to online help, however.



The Bad News: InterRamp's NewsReader downloads all posted newsgroups before letting you search.

Fruitless Search: There are no links to any of the common Web search engines from InterRamp's home page.

Lab Notes

InterRamp's strong suit is sending and receiving e-mail.

What Testers Said about InterRamp

"The [file attachment option] was easy to find. Also, I was able to view the [test image] to see what it was."
MARKETING CONSULTANT

"Having to download the enormous list of newsgroups frustrated me. When I interrupted the download the first time, the program crashed."
PROGRAMMER

"The menu for downloading files was too busy and confusing. I'd recommend enlarging the fonts or highlighting what is on the local directory and remote directory."
MARKETING CONSULTANT

Web browsing proved a bit more daunting. Testers complained that the InterRamp home page didn't point them to any search tools, and online help didn't even include mentions of the existence of search tools.

One particularly irksome problem: the lack of feedback from the Web Browser. For example, it doesn't display an hourglass while retrieving a Web page. And there's nothing to let you know which bitmap is being loaded or what percentage of the page is loaded. Clicking twice on the link to a page produces the error message, "Web page not available, currently being loaded by another user." In fact, *you* are the other user.

The ftp tool works a lot like Windows' File Manager. That means the interface is familiar if you already know where to find a file. But if you need to search for a file, you have to exit in order to run Archie or another search tool, then go back to the home page.

Testers had the most complaints about InterRamp's newsgroup reader. It downloads all of the more than 5,000 available newsgroups before you can search, and searches are limited to character matching. If you want to find a newsgroup on photography, you have to know to begin the search string with "rec." before you type "photo."

InterRamp proved well-suited to sending and receiving e-mail, but for other Internet tasks, there are better solutions.

InterRamp / Performance Systems Int'l / (703) 904-4100 / $50 for software; $29 registration fee, $9 per month for first 9 hours, $2 per hour after that or $29 per month for 29 hours / *Reader Service No. 744*

SUMMARY

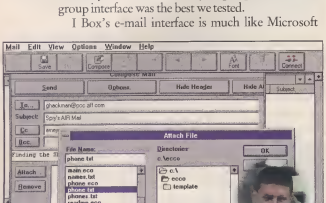
	E-mail	Web Access	File Transfer	Newsgroups
Satisfaction	Attaching files is easy.	Finding things is a pain.	Need to open a different app to search.	Searching and grouping were difficult.
Productivity	All testers completed all tasks.	Missing search engines on home page.	Non-integrated searching is difficult.	Too long to download all the groups.
Help System	No help was needed.	There's no information on searching.	You have to ask the right questions.	Help needs work.
Verdict	★★★★	★★½	★★½	★★

★★★★Excellent ★★★★ Good ★★★ Acceptable ★★Poor ★Unacceptable

I Box: Usable E-mail and Newsgroups

The plain-brown box with black type belies the sophistication of of Spry's Internet in a Box (I Box for short), a collection of six applications that gives you complete Internet access. These include the Spry Mosaic browser, Spry Mail for e-mail, Spry News for newsgroups, Spry Gopher, Network File Manager, and Spry Telnet. All together, the collection tied for top honors in *PC Computing*'s Usability Labs tests. One very bright spot: The newsgroup interface was the best we tested.

I Box's e-mail interface is much like Microsoft Mail, with separate folders for the in-box, deleted mail, and sent mail on the left of the screen, and a window with messages on the right. On the whole, users liked the interface, but several noted that when the dialog box to compose a message comes up, it's not full size. As such, the button for attaching files to mail messages is obscured, making that process a little tricky.

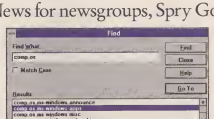


Easy E-mail: Spry's Internet in a Box AirMail application provides one of the best e-mail interfaces our testers had seen. One annoying oversight: When the Compose Mail window comes up, the Show Attachment button is obscured–you have to resize the window to see it.

Thanks to the Search Tools menu, you can use any of the common Web search engines. Even so, many usability testers had trouble finding the information our test script requested, and a few noted that the documentation neglected to explain what they needed to run a Web search. Overall, the selection was disappointing.

Usability testers complained that the search tools were hardly obvious. Actually, they're in a separate application—Spry Gopher—that you must launch to perform searches. One tester complained that the search engine he chose found the requested files as expected, but failed to let him know that it had found them.

I Box provides a good search engine to locate a particular topic within an Internet newsgroup. In addition, it collects newsgroups into categories, which lets you scan a category for a particular topic.



I'm Found! Locating a particular newsgroup with Spry News is easy . . . as long as you know its name.

Home Again: Spry Mosaic's Search Tools menu directs you to a variety of solid Internet search engines.

Although I Box didn't win our Usability Seal of Approval, it's a solid product. With some tweaks to the Web browser and its ftp capabilities, it would improve substantially.

Internet in a Box / Spry / (800) 998-4269, (206) 447-0300 / $95 estimated street price for software; access rates vary, Sprint Link charges $8.95 per month plus $8.95 per hour / *Reader Service No. 745*

Lab Notes

Although a good player overall, minor glitches held back usability ratings.

What Testers Said about Internet in a Box

"When the Compose box was up, if it wasn't (nearly) full-screen in size, the Attach button wasn't visible, nor was there any indication that there might be something off the edge."
PROGRAMMER

"Ftp was easy with Network File Manager—a good interface for those familiar with (Windows') File Manager."
FIELD SERVICE ENGINEER

"After a minute with the documentation, it was easy to find specific newsgroups."
PHOTOGRAPHER

SUMMARY

	E-mail	Web Access	File Transfer	Newsgroups
Satisfaction	Attach button is sometimes hidden.	Choice of search tools is weak.	Familiar interface.	Well-designed interface.
Productivity	Once you find the tools, it's easy.	Testers found what they needed.	Too much work.	Nice search and group capabilities.
Help System	You'll find what you need.	Didn't really help our testers.	More hand-holding is needed.	Always worked.
Verdict	****	***	***	****

*****Excellent ****Good ***Acceptable **Poor *Unacceptable*

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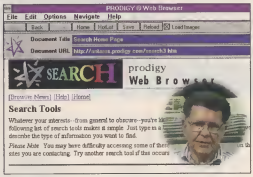
Circle 159 on reader service card.

The Most Usable Software

The Internet is not an easy neighborhood to find your way around. Sure, nerds like it. Given that it was created largely by technical organizations, that's no surprise. It is surprising, however, that none of the consumer-oriented access packages we tested earned *PC Computing*'s Usability Seal of Approval.

Three products—Pipeline New York, Prodigy, and Spry's Internet in a Box—came close, earning 3.5 stars in our tests, but fell half a star short of winning the seal.

With the exception of file transfer via ftp, each key task in our usability tests found a standout product: Prodigy had the best Web browser, Pipeline New York had the best e-mail, and Internet in a Box had the best Internet news reader.



Prodigy: Looking for something on the Web? Prodigy's home page includes links to most popular search engines. ★★★½

Pipeline New York: Originally designed as a regional service for New York, Pipeline offers the best e-mail interface. ★★★½

Internet in a Box: Spry's ample, easy-to-find Internet search tools and news readers pleased our usability testers. ★★★½

Pros

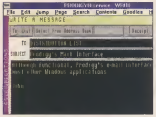
- **Search Menu:** Spry Mosaic includes great search tools built right into the menu bars.
- **Status:** Pipeline New York has a small status bar to indicate the progress of sending e-mail.
- **Starting Place:** Pipeline includes a generic menu that steers users toward search tools and interesting sites.

Cons

- **No Feedback:** PSI's InterRamp Web browser doesn't give good feedback on what it's doing.
- **Hidden Button:** When you select reply or compose in Spry Mail, the mail window hides the "show attachment" button.
- **Out-of-Date Interface:** Prodigy's DOS-like mail system looks archaic in the age of Windows.

Lab Notes: What Testers Said about Internet Access Services

Prodigy



"At first it seemed like it would be easy to attach the file. However, I had no warning that it could not send a bitmap file. I would have appreciated it if the program told me outright that it could not mail the bitmap."

MARKETING CONSULTANT

PSI InterRamp

"Having to download that enormous list of newsgroups frustrated me. When I tried to interrupt the download of the newsgroup list, the program crashed. PSI didn't provide an adequate 'beginning' list of newsgroups."

PROGRAMMER

NetCom NetCruiser

"NetCruiser doesn't have a link to a search engine on its Web browser home page. I couldn't use a Web search engine by typing in a keyword. The printed documentation provided some useful pointers, although not enough to let me find my topic."

PROGRAMMER

The Script

For every feature that warrants usability testing, we design a script that consists of a set of common tasks. We report test results in three key areas: user satisfaction, productivity, and help. The satisfaction score reflects the testers' preferences on a scale of one to five (in which five is best), the productivity score reflects the percentage of tasks completed, and the help score reflects the percentage of references to help that actually assisted testers complete a task.

SCORECARD HOW THE INTERNET ACCESS PRODUCTS COMPARE

Task	NetCom NetCruiser	Pipeline New York	Prodigy	PSI InterRamp	Spry Internet in a Box
1. E-mail *Weighting: 25%*	★★★ Usability testers had difficulty attaching binary files to mail messages.	★★★★½ Clearly marked features, lots of push-buttons, and a nice status indicator.	★★★★ Usability testers had difficulty attaching binary files to mail messages.	★★★★ Easy to attach files. All tasks were completed and no calls to help were needed.	★★★★ Undersized window may hide attachment button, but otherwise it's good.
2. World Wide Web Access *Weighting: 25%*	★★½ Testers had problems finding search tools, even when they consulted online help.	★★★ Testers felt that unless you are already experienced, accessing the Web is difficult.	★★★★½ Wow! A great home page, but the browser was hard to find.	★★½ There are no search engines on the InterRamp home page!	★★★ Separate menu that goes to the Web's search tools is a great addition.
3. FTP File Transfer *Weighting: 25%*	★★½ Interface is like Windows' File Manager—for better or worse.	★★★ Testers had a problem when they entered correct filename, but incorrect site.	★★★ File transfers are made from the Web browser—a bit nonintuitive.	★★½ Interface is like Windows' File Manager—for better or worse.	★★★ Interface is like Windows' File Manager, plus a good search link.
4. Newsgroups *Weighting: 25%*	★★½ Too many entries in a very small window, underpowered search utilities.	★★½ Almost none of the testers could find information.	★★★½ A great information locator for newsgroups.	★★ "Poor searching; downloads too much info," said our testers.	★★★★ Search engine was the best we tested.
Verdict *100%*	★★½ The e-mail interface proved mediocre, and finding information on the Net is too hard.	★★★½ Great mail highlights this product. Web searches, on the other hand, are a chore.	★★★½ Prodigy's service interface needs work, but it offers the best Web browser overall.	★★★ A capable e-mail manager is undermined by cryptic search tools.	★★★½ A good all-around Internet tool for e-mail, Web browsing, and reading newsgroups.

★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Final Analysis: I-Way On-Ramps Still under Construction

Instant Internet

If you think getting onto the Internet requires secret handshakes and special dances, you're in for a pleasant surprise. A year ago, sending e-mail, browsing the Web, and joining newsgroups meant mastering the arcane world of Winsock and TCP/IP. Now you can install a program, click on a few buttons, and you're on.

But once you're on, then what? Our rigorous usability testing showed that even one-click Internet solutions still have a way to go. Each product had a particularly strong feature—e-mail, Web access, ftp capability, or Internet newsgroups access—but none was usable enough overall to win the *PC Computing* Usability Seal of Approval.

What will you do on the Internet? Are you an e-mail junkie, or will you spend long hours browsing the Web? Think about what you need most from the Internet—then select the product strongest in that area. Right now, for example, none of the products we tested is an outstanding choice for everything—e-mail, Web access, newsgroups, and transferring files—although they all have their strong suits.

Where are you now? It's an odd question, but some people have compelling reasons to choose a specific package. Users who live in New York will probably find Pipeline to be the best choice because of the extra information it supplies about the town Frank Sinatra loves. If you already have Prodigy, you'll be able to stick with that and get a great Web browser.

What are you willing to spend? Service prices vary and are measured differently, so an apples-to-apples comparison of monthly costs is difficult. Prodigy—thanks to free software and low monthly payments—offers the best overall deal.

How fast do you want to go? All the services support 14.4Kbps modems in most areas. In some of our tests, Prodigy had a problem connecting at 14.4Kbps and we had to turn it down to a painful 9,600 bps. Two services—Internet in a Box and NetCruiser—support 28.8Kbps. And PSI's InterRamp supports ISDN connections (64Kbps). If you're online all the time and are serious about your connection speed, InterRamp over an ISDN link will be the solution for you.

DECISION MAKER

CHOOSE AN **INTERNET ACCESS PRODUCT** THAT SUITS YOUR NEEDS

1 Choose the factor most important to you.	2 Choose the next most important factor.	3 What else is important?	4 For your needs, the best product to buy is . . .
E-mail	Internet News	FTP	Spry Internet in a Box
		Web Browsing	Spry Internet in a Box
	Web Browsing	Internet News	Pipeline New York
		FTP	Pipeline New York
Internet News	E-mail	FTP	Spry Internet in a Box
		Web Browsing	Spry Internet in a Box
	Web Browsing	E-mail	Prodigy
		FTP	Prodigy
Web Browsing	Internet News	E-mail	Prodigy
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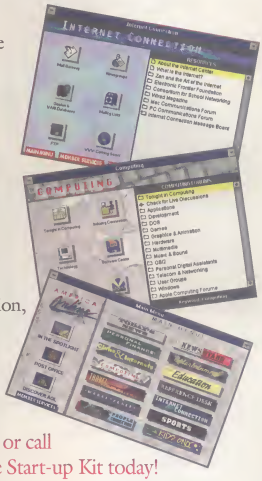

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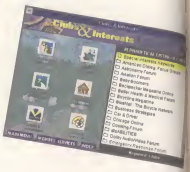

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ENHANCED IDE DRIVES: *EIDE offers lots of advantages—increased storage, fast speeds, and an affordable price tag. See if it is your ideal solution.* **134**

DO IT YOURSELF: *Follow our step-by-step instructions to evaluate your system before you upgrade your hard drive.* **138**

FINAL ANALYSIS: *SCSI vs. Enhanced IDE drive trade-offs.* **140**

What do you do now? You've already compressed your hard disk and ruthlessly banished to floppies all of the files you haven't touched in six months. And you've inspected all of your applications with the diligence of an IRS agent, looking for anything that can be zapped. But why kid yourself? You know you're going to buy another hard drive. If you're not out of hard disk space now, you will be.

Here's the good news: Expanding your desktop storage is easier and less expensive than ever before. With hard disk space selling for as little as 23 cents a megabyte, now is the time to upgrade the cramped hard disk that came with your system.

How much storage is enough? With many applications demanding 20MB or more—*lots* more if they include multimedia help files—figure on 500MB as the absolute minimum that can carry you until it's time to trade up your entire system. If you want space for audio or video files, 3-D graphics, color documents, or other megabyte-gobbling data, 1GB or more is your best investment. And for servers, the answer is easy: Buy as much storage as you can possibly afford.

Now comes the really tough part: Deciding what type of hard drive to buy. Should it be SCSI or IDE? Or what about the new Enhanced IDE (EIDE)? Which one is faster and which is easier to install? And of course, how much will it cost?

Relax. We'll help you swap aggravation for excitement with our look at three classes of drives: SCSI drives larger than 1GB, EIDE drives smaller than 1GB, and EIDE drives larger than 1GB. *PC Computing*'s Labs put each drive through a battery of tests for performance, usability, and ease of installation. And to ensure that your new drive isn't hamstrung by a slow controller, we tested the newest EIDE and SCSI adapters, because the best upgrade for you might also include a dose of new technology.

BY ADAM MEYERSON

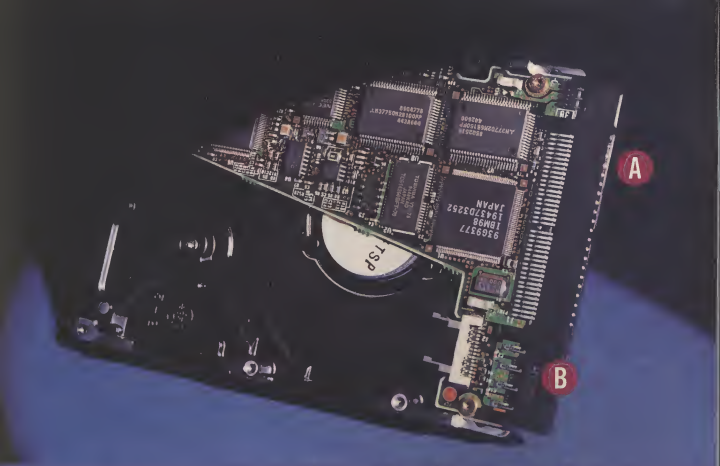
A CONNECT TWO: Each 40-pin EIDE cable can control two devices and allows for a transfer rate of up to 16.6MB per second.

B EASY ON: It's a snap to configure: Set the master/slave jumper, plug it in, and turn it on.

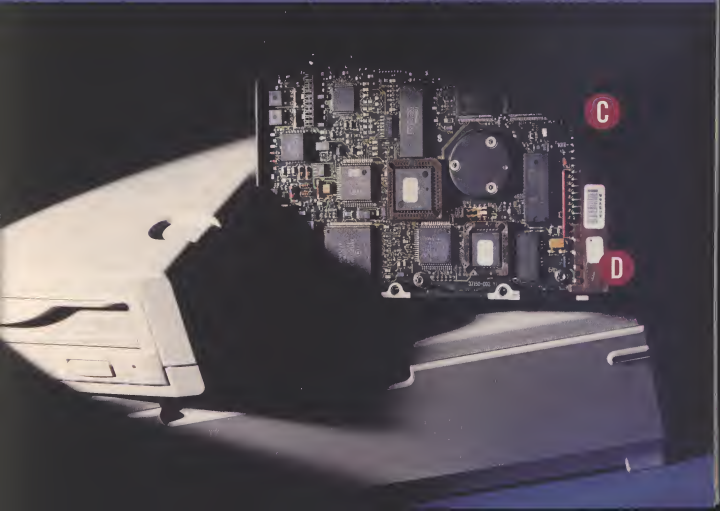
C CONNECT EVERYTHING: One SCSI card can control as many as seven devices, including scanners and CD-ROM drives.

D JUMPERAMA: With flexibility comes a configuration challenge: You must set jumpers and choose the proper SCSI ID.

PHOTOGRAPHS BY FRED STINSON



EIDE or SCSI? To choose wisely, look at your system and storage needs.



More Room to Grow

Executive Summary

This crop of SCSI drives includes two monster 4GB scorchers that are perfect for servers: Quantum's Grand Prix 4.3 and the Conner CFP4207. Our PCC Best award goes to the Grand Prix 4.3. While not the fastest of the drives we tested for this story, it beat out the Conner CFP4207 due to its extraordinarily low price. With a street price of just $999 (which comes to 23 cents per megabyte), the Grand Prix 4.3 is a steal.

Before you spend a lot of time sweating the SCSI vs. IDE question, consider this: Both SCSI and EIDE drives deliver plenty of performance. In our tests, the fastest SCSI drive turned in scores that were almost identical to the fastest EIDE drive. So why would you want to go with SCSI?

SCSI's big advantage is connectivity. A single SCSI card controls up to seven devices, including hard drives, tape drives, CD-ROM drives, optical drives, and scanners. If you're working on a server, SCSI's expandability and capacity make it by far the best choice—especially for drives of more than 2GB, since EIDE drives of similar capacity simply aren't available today. The biggest EIDE drive in our tests was Western Digital's 1.6GB Caviar AC31600. True, it's big, but it's no match for a 4GB SCSI drive.

Highlights At 4.2GB, Conner's CFP4207 is one of the biggest SCSI drives on the market. It's also the fastest. This big boy beat 17 SCSI and EIDE drives in our real-world tests that measure how quickly a drive transfers data from platters to processor. It's almost twice as fast as the slowest SCSI drive, Fujitsu's DynaDisq 1080. But you wouldn't think that by looking at the specs, because the Conner CFP4207's 512K cache, 7,200 rpm, and 10ms seek time are matched by several of the other SCSI drives that turned in much slower scores. To test performance we used ZD Labs' PC Bench test suite with no SmartDrive cache loaded. When we ran the tests with SmartDrive, the differences were smaller, though the rankings remained the same.

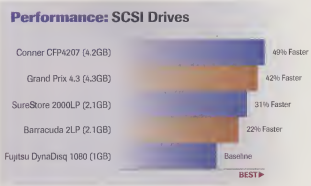
Winner on the Cheap: Quantum's Grand Prix 4.3GB SCSI drive isn't just big, it's fast. Better still, it's cheap—only 23 cents per megabyte. What more could you want?

But don't believe every spec you see. For example, even though the specs of Quantum's Grand Prix 4.3 look better than those of the Conner CFP4207, the Grand Prix 4.3 took second place in every test. While the Grand Prix is indeed one of the fastest drives around, its great price is what helped it to clinch the PCC Best award. At an estimated street price of $999, the Grand Prix 4.3 figures out to 23 cents per megabyte, roughly half the 40-cent-per-megabyte cost of the slightly faster Conner CFP4207.

Lowlights Unlike with IDE, installing a SCSI drive is an invitation for a migraine regardless of which brand drive you pick. You'll go through the jumper jig and the terminator twist with little or no help from the drive's maker. Only Micropolis and Seagate provide even basic documentation with their drives. For $1,000 or more, is a simple two-page manual too much to ask? We think not. And of the six SCSI drives we tested, only Quantum's Grand Prix 4.3 and Micropolis's Taurus 2 Model 4221 had labels for jumpers. But if you decide on a SCSI drive, you won't face the installation on your own. Read "Do-It-Yourself Upgrade" (page 138), and *PC Computing* will be there to guide you.

So what's keeping you from having more disk space than the average third-world country? Nothing but one or two thousand dollars and a few hours of your time.

Performance: SCSI Drives



NOTE: PCBENCH 9.0 IS DESIGNED TO MEASURE SYSTEM COMPONENT PERFORMANCE UNDER DOS

Rating SCSI Storage Solutions

How They Measure Up in Our Lab Tests

Product	Price*	Capacity	Seek time	Warranty (years)	Performance	Usability	Technology	Verdict
Grand Prix 4.3 Quantum Corp. (800) 624-5545 *Reader Service No. 756*	$999 (23 cents/MB)	4.3 GB	8ms	5	★★★★½ A real speed demon.	★★★★ Jumpers are clearly labeled.	★★★★★ Fast and Wide SCSI-2, 7,200 rpm, standby mode.	★★★★★ The ultimate deal: Fast, cheap, and big.
Conner CFP4207 Conner Peripherals (800) 626-6637 *Reader Service No. 757*	$1,689 (40 cents/MB)	4.2 GB	10ms	5	★★★★★ Fastest of all drives.	★★½ No labels on jumpers, no documentation; not much help during setup.	★★★★ The right specs: Fast SCSI-2, 7,200 rpm.	★★★★½ Great speed and design.
Barracuda 2LP Seagate Technology (408) 438-6550 *Reader Service No. 758*	$999 (48 cents/MB)	2.1 GB	9ms	5	★★★½ Lagged behind the leaders.	★★½ Basic documentation, but jumpers lack labels and setup is a crap shoot.	★★★★ SCSI-2 makes installation a breeze.	★★★½ Installation is a struggle, but the price is great. This drive is average in every other way.
SureStore 2000LP Hewlett-Packard (800) 826-4111 *Reader Service No. 759*	$1,150 direct (55 cents/MB)	2.1 GB	9.5ms	5	★★★★ Was on the heels of the leaders.	★★½ Installation ain't pretty.	★★★★ Well put together with Fast SCSI-2.	★★★½ Solid and speedy, but too pricey.
Taurus 2 Model 4221 Micropolis (800) 395-3748 *Reader Service No. 760*	$1,159 (55 cents/MB)	2.1 GB	9ms	5	★★★ Slow going in every test.	★★★★ Hallelujah: labeled jumpers *and* a quick-start guide!	★★★★ All the right stuff, including 7,200 rpm and Fast SCSI-2.	★★★½ A nice overall package, but this one is slow and a little expensive.
DynaDisq 1080 Fujitsu Computer Products (800) 626-4686 *Reader Service No. 761*	$485 direct (49 cents/MB)	1 GB	10ms	3	★★ Limped behind the pack in every test.	★★½ You're on your own during setup, with no assistance from a manual or labels.	★★★★ Up to snuff with Fast SCSI-2 and 5,400 rpm.	★★★ Cheap, but it needs a performance boost.

*ESTIMATED STREET PRICE UNLESS NOTED OTHERWISE

CONTROLLERS

SCSI IS THE BEST CHOICE FOR **MULTIPLE DEVICES**

If you don't have a SCSI controller in your desktop system, don't feel lonely. Unlike IDE, which is so cheap to slap right into the motherboard that it's not a serious factor in the final price of a system, adding a SCSI controller will cost from $149 to $399. However, it's worth the expense if you plan on using a wide range of devices. One SCSI card will control up to seven peripherals, including hard drives, CD-ROM drives, tape drives, and scanners. That's true of any SCSI card. What differs among SCSI controllers is their ease of installation, compatibility with other hardware, and performance.

You've probably heard all kinds of horror stories about installing a SCSI adapter. Most of them are true. With the diversity found in SCSI comes great potential for chaos. One card that breaks that mold is Adaptec's PCI SCSI Master Kit (see photo at right). Installing it is so easy that you'll find yourself wondering what all the fuss is about.

The Adaptec card's simple installation makes it a better investment for the squeamish than the less expensive and nearly as fast Future Domain TMC-3260. Both of these SCSI controllers are PCI, but they're also available in ISA versions.

PCI SCSI Master Kit / Adaptec / (800) 959-7274 / $399 direct / *Reader Service No. 762*

Future Domain TMC-3260SVP / Future Domain / (714) 253-0400 / $195 direct / *Reader Service No. 763*

Quick and Easy Expansion

Executive Summary

Will you be satisfied with a hard drive that holds less than a gigabyte of data? If so, then consider Seagate's Decathlon 850. It's a speedy drive and a sweet deal at $259 (a mere 30 cents per megabyte). Need more than a gigabyte? IBM's Deskstar XP is also affordable at $435 (44 cents per megabyte) and no slouch in the speed department. These drives offer excellent performance and headache-free installation, and they're easy on the pocketbook, too.

Ask your IDE drive, "What have you done for me lately?" Sure, IDE is an inexpensive, handy solution to expanded storage. But it's begun to look a little small, a little slow. IDE's 528MB limit grows more confining with the proliferation of multimedia and Windows applications that come compressed on umpteen floppy disks. And you can connect only two IDE drives to one controller. Come on, IDE, show us something new.

That something new is EIDE. Drive maker Western Digital took the existing IDE specification, upped the capacity, boosted performance, and added support for more devices. EIDE can deliver as much as 8.4GB per disk—although Windows 3.1 limits that to 2GB. What about performance? EIDE can blast 16.6MB per second (MBps) off the disk. That's fast—faster than SCSI-2 at 10MBps and much faster than traditional IDE, which topped out at 3.3MBps. Plus, the new EIDE standard not only lets you have up to four IDE hard drives but it also controls CD-ROM and tape drives, too. It has deservedly retained its place as the standard. Look inside any Pentium shipping today and you'll see two EIDE connectors right on the motherboard: one on the PCI bus for your hard disks and another for slower devices like CD-ROM drives and tapes.

Over or under a Gigabyte: Seagate's Decathlon 854MB drive (left) and IBM's Deskstar XP 1GB drive are the two fastest new Enhanced IDE peripherals we tested.

But before you rush out and buy a new EIDE drive, read "Do-It-Yourself Upgrade" (page 138). That way, you'll purchase all the right pieces to your storage puzzle. And to help you find the right drive, we brought ten of the newest EIDE drives into *PC Computing*'s Labs—five under 1GB and five over 1GB.

Performance tops the list of priorities when you're selecting a new drive. Of course, getting your new drive installed is the real work you must do before you can play with all of that performance and space. With this in mind, we also put each drive through an exhaustive usability checklist, paying particular attention to documentation, switches, jumpers, and overall construction.

Highlights Some of today's EIDE drives are as fast as the best SCSI drives. But the speed limits vary widely depending on a drive's transfer mode, cache size, and access time. When designing an EIDE drive, a company can specify—almost at whim—which transfer mode to use. Some companies choose more wisely than others. The two fastest drives under 1GB—Seagate's Decathlon 850 and Conner's DiskStor 850A—both run in Programmed I/O (PIO) mode 4, which pumps up to 16.6MBps. The slower drives run only PIO mode 3, which is limited to 11.1MBps. Seagate and Conner also include a healthy 256K cache with their drives. With the big drives there was a

Performance: Enhanced IDE Drives

NOTE: PCBENCH 9.0 IS DESIGNED TO MEASURE SYSTEM COMPONENT PERFORMANCE UNDER DOS.

Rating **Enhanced IDE** Storage Solutions

How They Measure Up in Our Lab Tests

Product	Price*	Capacity	Seek time	Warranty (years)	Performance	Usability	Technology	Verdict
Less than 1GB								
PC Co. **Decathlon 850** Seagate Technology (408) 438-6550 *Reader Service No. 764*	$259 (30 cents/ MB)	854 MB	11ms	3	★★★★½ Consistently speedy, placing second in every test.	★★★★ Fortunately, they printed the jumper index on the drive, so there's no need to refer back to the manual.	★★★★★ The whole enchilada: 256K cache, 5,400 rpm, and PIO mode 4.	★★★★★ Your best choice in the less-than-1GB category.
Caviar AC2850 Western Digital (800) 568-9272 *Reader Service No. 765*	$330 (39 cents/ MB)	854 MB	11ms	3	★★½ No speed here. It brought up the rear.	★★★★½ Intuitive setup and installation.	★★½ Needs to modernize: Only 64K cache and PIO mode 3.	★★★★ No speedster, but a solid package.
DiskStor 850A Conner Peripherals (800) 626-6637 *Reader Service No. 766*	$499 (59 cents/ MB)	852 MB	12ms	3	★★★★ No slowpoke, scoring well in all tests.	★★★★½ Valuable illustration, options list.	★★★½ Fully implemented EIDE, PIO mode 4, and 256K cache.	★★★★ A safe choice with good performance.
Deskstar IBM Personal Computer (800) 426-7299 *Reader Service No. 767*	$225 direct (42 cents/ MB)	540 MB	12ms	2	★★★½ A little faster than average.	★★★½ Process-of-elimination setup.	★★★½ Only 128K cache and PIO mode 3.	★★★½ Lowest price tag, but offers the least value.
Lightning 730 Quantum Corp. (800) 624-5545 *Reader Service No. 768*	$300 (41 cents/ MB)	731 MB	11ms	2	★★★½ Middle-of-the-road performance.	★★★½ Installation was frustrating, couldn't read the settings on jumpers.	★★★½ Only 128K cache and PIO mode 3.	★★★½ OK price, but a little slow.
1GB or More								
PC Co. **Deskstar XP** IBM Personal Computer (800) 426-7299 *Reader Service No. 769*	$435 (44 cents/ MB)	1 GB	10.5ms	5	★★★★★ Fastest of all the EIDE drives.	★★★★½ Good installation guide with diagrams.	★★★½ Big 512K cache and 5,400 rpm.	★★★★★ This is it if you need 1GB.
Samsung TBR-31080A Samsung Electronics (800) 726-7864 *Reader Service No. 770*	$395 (40 cents/ MB)	1 GB	9ms	2	★★★★ Impressive speed.	★★★★ Jumpers are all labeled, easy to install.	★★★★★ Well designed with 256K cache, PIO mode 4, and 5,400 rpm.	★★★★½ It's fast, easy to set up, and well designed. You wouldn't go wrong with this choice.
DiskStor 1275A Conner Peripherals (800) 626-6637 *Reader Service No. 771*	$499 (41 cents/ MB)	1.2 GB	12ms	3	★★★★ Solid performance in all areas.	★★★★½ It has a good manual and labels on jumpers.	★★★★★ It's all here: 256K cache, PIO mode 4, standby, and sleep mode.	★★★★ Good all-around drive.
Caviar AC31600 Western Digital (800) 568-9272 *Reader Service No. 772*	$899 direct (44 cents/ MB)	1.6 GB	10ms	3	★★½ Slowest of the over-1GB EIDE drives.	★★★★½ Easy to install with quick-start guide.	★★★★ Good design overall, but 128K cache is holding it back.	★★★½ Good warranty, but needs a speed boost.
Maxtor 71260A Maxtor Corp. (800) 262-9867 *Reader Service No. 773*	$454 (38 cents/ MB)	1.2 GB	12ms	2	★★★ Slow going.	★★★★ Comes with a quick-start guide.	★★★½ Cache is a good size at 256K, but slow PIO mode 3 and DMA.	★★★½ Just too slow. Great price, though.

*ESTIMATED STREET PRICE UNLESS NOTED OTHERWISE

similar pattern. IBM's Deskstar XP (DPEA 31080) 1GB drive with its 512K cache and 10.5ms seek time easily outperformed all the other 1GB and larger drives. Of course, SmartDrive helps close the gap between the slowest and fastest drives, but the differences are still measurable.

Lowlights If you're thinking that you'll be provided with clear, step-by-step manuals to help you install your new drive, think again. Of the ten drives, six come with no documentation. The others have a little bit better than nothing, but not much. The only drive smaller than 1GB to include even a scrap of paper is Conner's DiskStor 850A, which comes with a valuable illustration and a list of the options implemented on the drive. In the 1GB-plus group, Western Digital's Caviar AC31600 and Maxtor's 71260A provide minimal documentation. IBM's guide is the most extensive, with specifications, a clear illustration, and—a true gem—the technical-support number. For the most part, though, the documentation for these drives is stunningly bad. (The jumpers on Quantum's Lightning 730 are even labeled in a secret code.) This nearly universal lack of concern about documentation makes installation like driving across the country without a map or road signs.

Confusion Reigns Another key to top-notch drive performance is access time—the delay between the moment you issue a command to open a file or launch an application and the moment the disk actually finds it. While it's the most commonly quoted number for disk performance, it's also the most misleading. Access time is really a combination of two factors. One is *seek time,* which is how long it takes the drive heads to move across the spinning disk (like a needle moving across a record). The other factor is *rotational latency,* the time it takes the spinning drive platter to bring the bit of data you want under the read/write head.

An acceptable seek time for a drive is between 7ms and 12ms. If you see a drive advertised with an *access* time of 12ms or faster, you're actually being informed of only the seek time.

Our benchmark tests help cut through all the specs and techno-talk. In the smaller-than-1GB class, Seagate's Decathlon 850 was hands down the fastest drive in our PC Bench, WinBench, and Winstone tests. Following close behind in every test was Conner's DiskStor 850A. Both drives give you about 850MB of capacity and great speed. If 850MB isn't enough for you, we recommend IBM's Deskstar XP 1GB drive. It blasted through every test, outperforming its competition among the larger drives by a healthy margin. Other top performers in the larger-than-1GB class were Conner's DiskStor 1275A 1.2GB drive and—a newcomer to the drive business—the Samsung TBR-31080A.

Once IDE was the poor system's hard drive. Now with EIDE, you really can have it all: price, performance, and enough storage for most mortals.

CONTROLLERS EIDE IS THE **LOW-COST** STORAGE SOLUTION

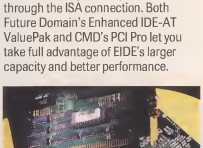
Adding a new Enhanced IDE (EIDE) drive to your system is easier than installing a SCSI drive—provided you have an EIDE controller. If you bought a Pentium PC within the last 12 months, it's almost certain to have EIDE built right into the motherboard. But if your system is older, or if you bought it from the back of some guy's station wagon and discovered too late that it didn't have EIDE, there's an easy solution: Add an EIDE controller yourself.

We tested a crop of new EIDE controllers. They range from basic and dirt cheap to full-featured and, well, still dirt cheap. The most expensive ones cost around $49. The key to finding the right controller is first examining your system to learn what type of slots you have available.

If you have an older system with ISA expansion slots and no PCI local-bus slots, your best choice is Future Domain's EIDE-AT ValuePak (see photo, top). This package includes everything you're going to need in order to connect up to four devices.

If you need to add a PCI EIDE controller, you have plenty of choices, including some bad ones. We started with four controllers, but we could get only two to work properly. A good safe bet is CMD's PCI Pro (see photo, bottom). It was the easiest to install, and it's a complete solution, supporting four CD-ROM or EIDE drives. Plus, it's the fastest at moving data from drive to CPU.

There's one technical quirk with add-on PCI EIDE controllers: Most PCI systems can't map interrupts 14 and 15 to a PCI slot. Since those interrupts are typically needed by a disk controller, you need a workaround, which comes in the form of a paddle card. A paddle card is a tiny adapter that fits into a standard ISA slot and connects via a cable to a PCI controller, allowing the controller to tap interrupts 14 and 15 through the ISA connection. Both Future Domain's Enhanced IDE-AT ValuePak and CMD's PCI Pro let you take full advantage of EIDE's larger capacity and better performance.



Future Domain EIDE-AT ValuePak / Future Domain / (714) 253-0400 / $48 direct / *Reader Service No. 774*

PCI Pro / CMD / (714) 454-0800 / $49 direct / *Reader Service No. 775*

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Do-It-Yourself Upgrade

Installing a new hard drive isn't that difficult if you take it one step at a time. But first you have to know what steps to take. The following is a detailed walk-through of the critical questions to consider when selecting and installing a new drive.

Do I have space to add another drive? To add a new internal drive you'll need at least a single half-height drive bay. Half-height bays are 1.5 inches tall and about 4 inches wide—roughly the size of a Nintendo Game Boy. Almost any drive of 2GB or smaller will fit in this size bay. If you're adding a larger drive—say, 4GB—then you'll need a full-size bay, which is about 2 inches tall and a fraction under 6 inches wide. If you have no open drive bays, consider an external SCSI drive.

What kind of hard drive does my system already have? If your hard drive is 540MB or less, it's probably IDE. Another key to its identity is its data cable. IDE runs off a 40-pin ribbon cable, which is just a fraction over 2 inches wide. If your cable is a full 2.5 inches wide, you have SCSI.

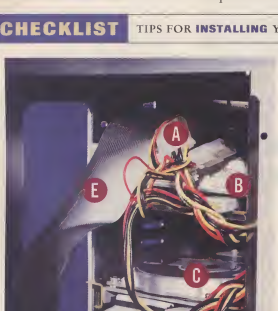
Will I need a controller? Standard IDE can control only two hard drives. If you have one IDE drive, adding a second standard IDE drive is easy. If, on the other hand, you already have two IDE drives, things get more complicated. You really have two choices: One is to remove one of your drives and replace it with a larger one. The other is to upgrade to an EIDE controller to handle both your current drives and the new one.

If you already have SCSI drives, adding another drive should be easy. The key is to use a cable with enough connectors. Most internal SCSI cables come with three connectors: one for the controller and two for the SCSI devices. You can easily replace your cable with a cable that has up to eight connectors: one for the controller and seven for a variety of other devices. If you already have an external SCSI drive attached to your computer, you can daisy-chain other devices with external cables.

What about power? To power your new drive, you're going to need an unused power connector. If you don't have one available, you can pick up a Y splitter, which will convert one of your existing power-cable connections into two connectors.

How do I mount the new drive? This would be easy if systems came with extra mounting rails, but most don't. Take a look at how the drives in your system are mounted. If they're screwed into the side of the drive-bay housing with no special rails, all you need are screws. If you see rails on the drives that slide into the bay, you'll need a set for your new drive. Take one of the rails with you to the store to get a match. Because some systems require custom rails, you may need to order directly from the drive manufacturer.

CHECKLIST TIPS FOR INSTALLING YOUR NEW DRIVE



A. Power Up Each drive in your system needs its own power cable. Make sure you have one for the new drive you're about to add, and that it's long enough. You can always add another connector by using a Y splitter that will turn one power cable into two.

B. Mount Up To mount a 5.25-inch drive like this one, you have two choices: If your system uses no mounting rails, you mount the drive directly onto the case with screws. If your system does use rails, you first mount them on the drive, then either slide them into slots or screw them into the case.

C. Fit In This 3.5-inch drive is mounted in a full-size bay using a mounting kit. The mounting kit fills out the smaller drive so that it can be installed in the larger bay. Most drives don't come with a mounting kit, so before purchasing a particular drive, check your system to see if you need one.

E. Get Connected To connect your new drive you'll need a cable with an available connector. Check your existing cable for an open connector and make sure it reaches where you will install the new drive. In some cases you may have to disconnect and reroute existing cables.

D. Got Space? Before you select your new hard drive, make sure you have the space to install it. This tower case has several empty drive bays that will accommodate just about any drive. That's common in towers, but many slim-line desktop systems don't have available bays. If that's the case, you can always go with an external SCSI drive.

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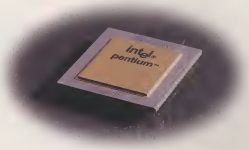

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Final Analysis: There's Never Been a Better Time to Upgrade

Up-to-Speed Drives

If you find yourself struggling with disk space, you've got great timing. Just a year ago the average drive that shipped with a new system was 240MB to 300MB. Today it's grown to 500MB and is quickly approaching 750MB. When we looked at drives in April 1994 (see "Big Drives in Tiny Packages," page 154), the best price was 50 cents per megabyte. As it stands now, that's the about the *most* you should pay. When shopping for your new drive, keep in mind that prices can vary widely depending on where you buy.

The first question you'll encounter as you prepare to upgrade concerns the interface. Should you go with SCSI or IDE? You used to have to settle for IDE's limitations, but the new bigger and faster EIDE is an enormous success. Our hat goes off to Western Digital and the other drive companies for taking an existing standard, patching its limitations, and keeping it backward compatible. But is EIDE for everyone? No. Like anything else, there isn't only one solution. If you're already running IDE in your system, EIDE will probably be the simplest to add. You should also consider your long-term storage needs. EIDE is perfect if you're upgrading desktop systems and your storage needs are limited to 1GB or less. And don't forget to check on your controller. A standard IDE controller won't take advantage of EIDE's capacity or performance.

But as your storage needs grow to beyond 1GB, you should start thinking about SCSI. There's a much bigger selection of high-capacity SCSI drives. And finally, there's the question of other devices beyond your disk drives. If you'll be using multiple devices such as CD-ROM drives, tape drives, scanners, or optical drives, take a look at SCSI. (But don't forget that the new EIDE runs both CD-ROM and tape drives.)

Adding a hard drive is easy if you do your homework. Examine your existing hardware and shop around before you buy. And be sure to give yourself a comfortable margin for growth—you'll be needing another gigabyte of storage sooner than you think.

DECISION MAKER

CHOOSE A **HARD DRIVE** THAT SUITS YOUR BUSINESS NEEDS

1 What type and capacity drive do you need?	2 What's most important to you?	3 What else is important?	4 For your needs, the best product to buy is . . .
Enhanced IDE: Smaller Than 1GB	Price	Performance	Quantum Lightning 730
		Usability	Caviar AC2850
	Performance	Price	Seagate Decathlon 850
		Usability	Seagate Decathlon 850
Enhanced IDE: Larger Than 1GB	Price	Performance	Samsung TBR-31080A
		Usability	Samsung TBR-31080A
	Performance	Price	IBM Deskstar XP
		Usability	IBM Deskstar XP
SCSI: Larger Than 1GB	Price	Performance	Quantum Grand Prix 4.3
		Usability	Quantum Grand Prix 4.3
	Performance	Price	Conner CFP4207
		Usability	Quantum Grand Prix 4.3

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Video/H-sync Bandwidth:	30-50kHz	30-64kHz
Front Panel Controls:	Digital	Digital

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The Sharpest Image

SYNOPSIS

17-INCH DISPLAYS: *The new standard for the Windows desktop, a 17-inch monitor will improve your outlook on Windows and increase your productivity, to boot. We evaluate 19 of the best.* **144**

20- AND 21-INCH DISPLAYS: *For the two-page view of Windows, step up to a high-resolution 20- or 21-inch monitor. We test the top 14 to find the best in this class.* **148**

FINAL ANALYSIS: *One page or two? A guide to choosing the right size monitor for your applications.* **150**

Nothing will convince you of the advantages of a bigger monitor better than spending time in front of one. If you try it, however, beware: There's no going back. Once you've seen what a bright, crisp, high-resolution display can do, the cramped 14-inch porthole on your desk will feel mighty confining. Jump up to a 17-inch display and resolutions of 1,024 by 768 pixels become feasible, letting you view more information and detail. Suddenly you can view a full page of text onscreen all at once, rather than just the top half of a document; spreadsheets display more columns and rows. Not only does this cut the time you spend scrolling around in documents, it makes multitasking easier: Tap out a letter in one corner of the screen, for example, and you can refer to an e-mail message in a window in the other corner.

On 20- and 21-inch displays the view gets better still, allowing you to display resolutions of 1,280 by 1,024 or higher. They're ideal for page layout, large photo images or illustrations, mega-spreadsheets, or for displaying two full-page documents or more than two application windows onscreen at a time.

To find out how the latest generation of large-screen displays stacks up, we tested 19 of the best 17-inch monitors and 14 of the best 20- and 21-inch monitors you can buy. Although almost all offer a significant advantage over the 14- and 15-inch displays that ship with most desktop systems, image quality, color quality, and usability varied widely.

As recently as a year ago these high-resolution, large-screen displays cost as much as or more than the system on your desk. However, increased demand and economies of scale have driven prices out of the stratosphere and well within reach of most budgets. And unlike PCs, monitors don't become obsolete with each new operating system and CPU introduction. Buy a large monitor to accompany the system you buy today—and it'll work nicely with that P6 you'll be eyeing this fall, too.

A THINK BIG: 17-inch displays offer as much as 50 percent more real estate than the standard 14-inch monitors that ship with most desktop systems. The larger screens are ideal for resolutions of 1,024 by 768 pixels under Windows.

B THINK BIGGER: 20- and 21-inch displays let you use ultrahigh resolutions (1,280 by 1,024 and even 1,600 by 1,200 pixels) without eyestrain—whether you work with tiny type and fine lines for desktop publishing, or you simply want more viewing space.

BY WENDY TAYLOR

PHOTOGRAPHS BY ERIC HILDLANDER

Sweet Seventeen: On a 17-inch display, 1024-by-768 resolution lets you view several application windows at a time.

Tight Control: Digital microprocessor-based image controls let you precisely adjust the image size, color, and position to your liking.

A

Panoramic Windows: Spend less time scrolling and more time working.

B

Full Page View: 20- and 21-inch screens display resolutions of 1280-by-1024 and higher, although some people find that they require more pixels than the design.

Design in Detail: What's new in 20- and 21-inch monitors this year? Improved usability, particularly in the design of front-panel and onscreen controls.

The Full-Page View

Executive Summary

The proof is in the picture, and Sony's Multiscan 17sf was a clear favorite in our juried image tests. Not only were the colors rich and even, focus was tight—ideal for displaying fine lines and 6 point type. Only Nanao's Trinitron model, the FlexScan T2-17 came close, though at $1,249 it also costs several hundred more than Sony's display. If you prefer the look of a shadow-mask tube, Optiquest's $745 4500DC and NEC's $799 MultiSync XV 17 are also worth checking out.

When it comes to getting the most out of Windows, a 17-inch monitor capable of displaying 1,024 by 768 pixels is guaranteed to boost your productivity. The added desktop space that a 17-inch monitor provides lets you squeeze 30 to 50 percent more information onscreen than you can manage with a 14-inch VGA display, so you can easily have several application windows active at once. For desktop publishers, 17-inch monitors also work nicely for single-page tasks—though a larger 20- or 21-inch display is easier on the eyes for highly detailed page layout. And while all of the 17-inch displays we tested support resolutions of 1,280 by 1,024, realistically you'll want a 20- or 21-inch display to work at that higher resolution.

Highlights Image quality is highly subjective, as we found in our juried image tests. While some testers preferred the rich hues of the Trinitron tubes found in Sony's Multiscan 17sf and Nanao's FlexScan T2-17, others liked the look of the shadow-mask tubes like those found in Optiquest's 4500DC and NEC's MultiSync XV 17. Overall however, eyes lingered longest on monitors with Trinitron tubes, particularly Sony's Multiscan 17sf. This Sony monitor and Nanao's FlexScan models also took top honors for usability. Nanao's combination of onscreen and front-panel controls was particularly well received by our usability testers. Sony's display offers fewer image controls, but they're easy to use.

Trinitron Treat: One look and you'll want it. Colors are rich and bright on Sony's Multiscan 17sf, and focus is exceptional—even on fine lines and small type.

Complete Control: Touch the front-panel controls on Nanao's FlexScan T2-17 or FlexScan F2-17EX and a software control panel appears onscreen to step you through more complicated adjustments. Rather not futz with software controls? Use the buttons on the front of the display instead.

Lowlights We did encounter some disappointments in testing. Epson's 17-inch SVGA failed to meet the Swedish MPR-II low emissions standard in our tests. And several monitors need improvements in their image-control design. For example, Mitsubishi's Diamond Pro 17TX and Diamond Scan 17FS include controls for adjusting virtually every aspect of a monitor's image, but deciphering them requires the better part of an afternoon. Touch the wrong combination of buttons and you'll have to start adjusting all over again.

Overall, the news from this year's crop of 17-inch displays is good: You get more for less. The clear standout is Sony's Multiscan 17sf. Not only was it a favorite in our subjective image tests, but at $899 it's also one of the most affordable. Nanao's FlexScan T2-17 Trinitron came in a close second in image quality tests, but at $1,249, it's one of the priciest monitors in this class. Like the look of a shadow-mask tube? Then you'll like what you see with Optiquest's $745 4500DC or NEC's $799 MultiSync XV 17.

Rating 17-Inch Monitors

How They Measure Up in Our Lab Tests

Product	Price*	Tube Type	Dot Pitch (mm)	Max. Res. (noninterlaced)	Performance	Usability	Technology	Verdict
Multiscan 17sf Sony *Reader Service No. 780*	$899	Trinitron	0.25	1,280 by 1,024 at 60Hz	★★★★★ An all-around favorite with jury testers.	★★★★ Controls are easy to use, although they lack some advanced options.	★★★★★ First-class everything.	★★★★★ The all-around image and usability champ, for a great price.
FlexScan T2-17 Nanao USA *Reader Service No. 781*	$1,249	Trinitron	0.25	1,600 by 1,200 at 66Hz	★★★★½ Bright, great contrast, clear picture.	★★★★★ Image controls set the usability standard, onscreen and off.	★★★★★ Same great design as Nanao's F2-17EX, with a first-class Trinitron tube.	★★★★½ A little pricey—but built to last the ages.
FlexScan F2-17EX Nanao USA *Reader Service No. 782*	$952	Shadow mask	0.26	1,600 by 1,200 at 66Hz	★★★★ Rich colors but text isn't quite as sharp as the Trinitron model.	★★★★★ Same image controls as on the FlexScan T2-17—far and away the best all around.	★★★★½ Rock-solid design that promises to last and last.	★★★★½ Stands out in usability and design.
Diamond Pro 17TX Mitsubishi *Reader Service No. 783*	$1,055	Trinitron	0.28	1,280 by 1,024 at 74Hz	★★★★½ Crystal clear colors and crisp text.	★★ Keep the manual; you'll need it to decipher the front-panel controls.	★★★★½ Top-of-the-line components—including Mitsubishi's new Diamondtron tube.	★★★★ The controls need work, but the images are terrific.
IBM 17P IBM PC Company *Reader Service No. 784*	$1,099	Trinitron	0.26	1,280 by 1,024 at 77Hz	★★★★ Rich colors, crisp text.	★★★★ Clearly marked image controls; but it needs a sleeker design.	★★★★ Solid components.	★★★★ A fine addition to any desktop.
Multigraph 447X Nokia *Reader Service No. 785*	$999	Shadow mask	0.26	1,280 by 1,024 at 76Hz	★★★★½ Excellent contrast and focus.	★★★★ Easy-to-use onscreen controls, but the implementation needs an update.	★★★★ Meets or beats every ergo standard; but power management wasn't as good as others in its class.	★★★★ Lots of engineering wizardry at a good price.
MultiSync XE 17 NEC Technologies *Reader Service No. 786*	$1,060	Shadow mask	0.28	1,280 by 1,024 at 60Hz	★★★★ Excellent color, but focus begins to fade on 6-point type.	★★★★½ Excellent onscreen controls; animated icons describe what's being adjusted.	★★★★ Fine design and solid components.	★★★★ A desktop standard—you won't go wrong.
MultiSync XV 17 NEC Technologies *Reader Service No. 787*	$799	Shadow mask	0.28	1,280 by 1,024 at 60Hz	★★★★ Good contrast and bright colors—but focus wanders on 6-point type.	★★★★½ The same controls as its MultiSync XE 17 cousin.	★★★★ Nice design and solid components.	★★★★ The twin of NEC's MultiSync XE 17, without an antiglare coating.
Optiquest 4500DC Optiquest *Reader Service No. 788*	$745	Shadow mask	0.28	1,600 by 1,280 at 60Hz	★★★★½ A top contender with our jury of imaging experts.	★★★½ Straightforward front-panel controls—but watch out for the flimsy control cover.	★★★½ All the basics. We wouldn't mind a sturdier case design, though.	★★★★ Sharp images and a great price—only the design holds it back.

*ESTIMATED STREET PRICE UNLESS NOTED OTHERWISE

continued on page 146

Rating 17-Inch Monitors *continued from page 145*

How They Measure Up in Our Lab Tests

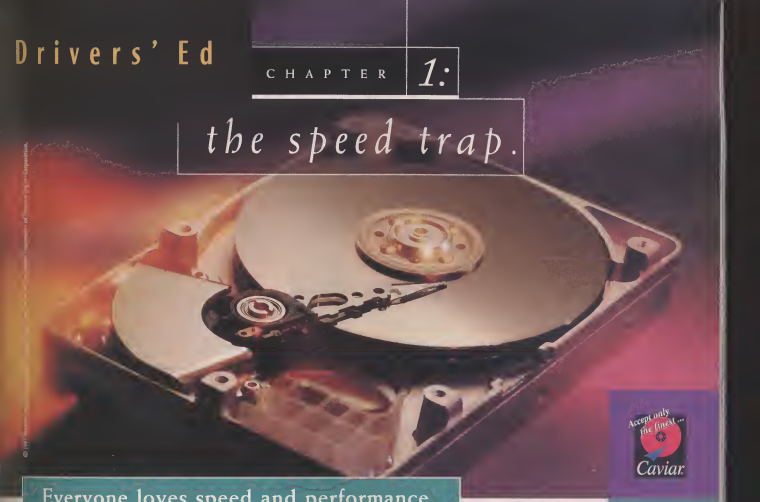
Product	Price*	Tube Type	Dot Pitch (mm)	Max. Res. (noninterlaced)	Performance	Usability	Technology	Verdict
Diamond Scan 17FS Mitsubishi *Reader Service No. 789*	$889	Shadow mask	0.25	1,280 by 1,024 at 75Hz	★★★½ Even colors, but text could be sharper.	★★ Adjusting the front-panel image controls is about as unintuitive as it gets.	★★★★½ First-rate components.	★★★½ A mixed bag. Nice colors, but focus could stand improvement.
Panasonic C-1792P Panasonic *Reader Service No. 790*	$1,099	Shadow mask	0.27	1,280 by 1,024 at 77Hz	★★★½ Brightness and sharp contrast make text easy to read, but colors are wan.	★★★★ Onscreen controls cover a large area of the screen, but they're easy to use.	★★★½ No innovations, but the components are solid.	★★★½ All the basics, but colors could be brighter.
PrecisionColor Display/17 Radius *Reader Service No. 791*	$1,099	Trinitron	0.26	1,280 by 1,024 at 75Hz	★★★½ Rich colors, but focus could be sharper on fine type.	★★★ How about some labels on those controls?	★★★ All the basics in a Trinitron, but not much more. Power management needs work.	★★★½ Not a bad choice, but we'll wait for the next version.
ViewSonic 17GA ViewSonic *Reader Service No. 792*	$889	Shadow mask	0.27	1,600 by 1,280 at 60Hz	★★★½ Clear text, but brightness and contrast could be better.	★★★★ Straightforward controls.	★★★½ No cutting-edge components—just the basics.	★★★½ Fine for text, but colors are murky.
SyncMaster 17GLs Samsung *Reader Service No. 793*	$799	Shadow mask	0.26	1,600 by 1,200 at 60Hz	★★★ Focus is good, but colors appear washed out.	★★★½ Push-button controls are easy to touch.	★★★ Average all the way around.	★★★ Low cost and no frills.
VisionMaster 17 Iiyama *Reader Service No. 794*	$899	Shadow mask	0.26	1,600 by 1,200 at 66Hz	★★½ Colors have a reddish cast; text is passable.	★★★½ Easy-to-use LCD controls.	★★ Middle-of-the-road components yield middling image quality.	★★★ Attractive price, but design and image quality need work.
Mag MXP 17F Mag Innovision *Reader Service No. 795*	$879	Shadow mask	0.26	1,280 by 1,024 at 76Hz	★★ Jurors rated the colors too dark and the whites too dull.	★★½ Cryptic digital image controls.	★★ Me-too components and design.	★★½ Only the price stands out.
Philips 17A Philips *Reader Service No. 796*	$999	Shadow mask	0.26	1,280 by 1,024 at 60Hz	★★ Poor contrast and uneven colors.	★★★ Controls are up front and easy; flimsy tilt-and-swivel base.	★★★ Don't try 1,280 by 1,024 with this one; design could be more solid.	★★½ Too murky to spend hours looking at.
ErgoView 170 Sigma Design Systems *Reader Service No. 797*	$1,199	Shadow mask	0.27	1,800 by 1,200 at 60Hz	★★ Low ratings from testers in focus and color quality.	★★★ LCD controls are easy to adjust but a bit spare.	★★ A better tube might help image quality.	★★ You'll find better displays for the money.
Epson 17-inch SVGA Epson America	$599	Shadow mask	0.28	1,280 by 1,024 at 60Hz	★★ Text and fine lines blur.	★★ Image controls are difficult to negotiate.	★ Failed MPR-II emissions test.	★ The lowest price you'll find, but too many shortcomings to recommend.

*ESTIMATED STREET PRICE UNLESS NOTED OTHERWISE

Drivers' Ed

CHAPTER 1:

the speed trap.



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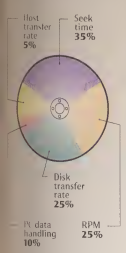
Relative influence of factors affecting drive performance.



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The Two-Page View

Executive Summary

Spacious 20- and 21-inch displays are ideal for displaying ultrahigh resolutions without eyestrain, whether you work with tiny type and fine lines—as in desktop publishing, illustration, and design—or you merely want to view multiple Windows applications onscreen at the same time. The clear winner in our juried image-quality tests? Nanao's FlexScan T2-20. Runners up included Mitsubishi's Diamond Pro 21TX, Nanao's FX2-21, NEC's MultiSync XP 21 and ViewSonic's 21PS.

Roomy 20- and 21-inch displays might seem like overkill for most desktop PCs—decadent even. But now that graphics cards capable of 1,024 by 768, 1,280 by 1,024, and higher resolutions have become standard fare (see "The Fastest True-Color Cards," page 157) you'll want a monitor capable of syncing to these resolutions.

Image quality is critical in displays this large since irregularities in color, glare, and other flaws tend to be magnified. To ensure the best image quality possible, we required that all the displays use flat shadow-mask or Trinitron tubes that minimize glare and image distortion. They also had to have a dot pitch of 0.31mm or smaller (the finer the dot pitch, the sharper the image focus). We also required that they include digital controls for fine-tuning the image.

Highlights Image quality is highly subjective, but our testers were unanimous in rating Nanao's FlexScan T2-20 as their favorite. Colors were rich and even, and focus was tight, thanks to a finely tuned Trinitron tube and careful attention to design. They also rated the controls on the T2-20 as their favorite overall because they let you adjust the image either from onscreen software controls or the front panel, then save your favorite settings in memory. Our usability testers also liked the unique remote control option for adjusting the tilt-and-swivel base on Iiyama's VisionMaster Pro 21—handy if the monitor needs to be perched out of arm's reach. Other favorites included Mitsubishi's Diamond Pro 21TX, Nanao's FlexScan FX2-21 (the shadow-mask version of the FlexScan T2-20, it's engineered to display 1,600 by 1,200 pixels at a flicker-free 75Hz refresh rate), NEC's MultiSync XP 21, and ViewSonic's 21PS.

View from the Top: Improve your outlook on Windows—put a FlexScan T2-20 on your desk. Nanao's 20-inch Trinitron tube swept the jury in image quality tests.

Remote Control: Iiyama's VisionMaster Pro 21 features a control panel on a card that fits in a slide-out tray, so you can carry the control panel around like a TV remote. Tune the contrast and brightness, or use it to adjust the motorized tilt-and-swivel base. Just don't misplace that remote control.

Lowlights Despite great strides in usability in the last year on some fronts (image controls on these displays were universally better this year than last), some problems persist. Maintaining uniform focus and color quality on a display this large is no easy task, and some displays managed it better than others. Jury testers found text and fine lines too blurry and indistinct on Mag Innovision's Mag MX 21F and Sigma's ErgoView 210 to recommend. The ErgoView also failed our MPR-II emissions tests. Optiquest's 2082DC also fared poorly in emissions testing; it passed, but only barely.

Looks aren't everything, but they count for a lot when choosing a monitor. Nanao's FlexScan T2-20 not only beams the sharpest image, its solid case design and easy-to-use front-panel digital controls bring usability into the picture as well.

Rating 20- and 21-Inch Monitors

How They Measure Up in Our Lab Tests

Product	Price*	Tube Type	Dot Pitch (mm)	Max. Res. (noninterlaced)	Performance	Usability	Technology	Verdict
FlexScan T2-20 Nanao USA *Reader Service No. 798*	$2,120	20-inch Trinitron	0.30	1,600 by 1,200 at 66Hz	★★★★★ As good as it gets. 17-inch models.	★★★★★ Same great onscreen controls as Nanao's	★★★★★ Top-notch everything.	★★★★★ It sets the standard.
Diamond Pro 21TX Mitsubishi *Reader Service No. 799*	$1,855	21-inch Trinitron	0.30	1,600 by 1,200 at 75Hz	★★★★½ Rich, uniform colors, sharp focus.	★★★★ Onscreen controls and case design drew raves.	★★★★½ First-rate components.	★★★★½ Full 21-inch view.
FlexScan FX2-21 Nanao USA *Reader Service No. 800*	$2,957	21-inch shadow mask	0.26	1,600 by 1,200 at 75Hz	★★★★½ Tight focus from bezel to bezel.	★★★★★ Great onscreen controls.	★★★★★ It will probably outlive you.	★★★★½ Pricey, but the one to buy for 1,600 by 1,200.
MultiSync XP 21 NEC Technologies *Reader Service No. 801*	$2,580	21-inch shadow mask	0.28	1,600 by 1,200 at 70Hz	★★★★ Deep, rich colors; average focus.	★★★★½ Fine onscreen controls—animated icons and all.	★★★★½ High-end components in a sharp design.	★★★★ Great image quality, but it's expensive.
ViewSonic 21PS ViewSonic *Reader Service No. 802*	$1,749	21-inch shadow mask	0.25	1,600 by 1,280 at 60Hz	★★★★ Nice, even colors and sharp text.	★★★★ Easy-to-use controls.	★★★★ Tight dot pitch, solid components.	★★★★ A nice package at a great price.
IBM 21P IBM PC Company *Reader Service No. 803*	$2,159	21-inch Trinitron	0.31	1,600 by 1,200 at 60Hz	★★★½ Rich, uniform colors; focus could be better on text.	★★★★ Control panel is easy to use.	★★★★ Solid, but it needs a tighter dot pitch.	★★★½ A fine contender in need of a redesign.
Multigraph 455X Nokia *Reader Service No. 804*	$2,250	21-inch shadow mask	0.26	1,600 by 1,200 at 76Hz	★★★½ Focus is tight, but colors are anemic.	★★★★ Onscreen controls for everything.	★★★★½ Supports every ergo standard.	★★★½ All the right pieces, but a tad pricey.
Philips 21B Philips *Reader Service No. 805*	$2,299	21-inch shadow mask	0.28	1,600 by 1,200 at 72Hz	★★★ Middling image quality.	★★★½ Straightforward controls.	★★★½ Solid, if uninspired, design.	★★★⅓ No innovations, but it gets the job done.
VisionMaster Pro 21 Iiyama *Reader Service No. 806*	$1,669	21-inch Trinitron	0.30	1,600 by 1,200 at 70Hz	★★★ Bright colors, but the focus degrades at the edges.	★★★★ Remote-control adjusts even the motorized tilt-and-swivel base.	★★★★ The only remote control monitor you can buy.	★★★½ Lots of bells and whistles.
SuperMatch 21T XL Radius *Reader Service No. 807*	$2,199	21-inch Trinitron	0.31	1,600 by 1,200 at 69Hz	★★★ Whites have a reddish cast.	★★ Tiny buttons are a pain; flimsy control cover.	★★★ A tighter dot pitch would improve focus.	★★★ There are better (and cheaper) options.
SuperScan Elite 21 NSA/Hitachi *Reader Service No. 808*	$1,995	21-inch shadow mask	0.28	1,600 by 1,200 at 72Hz	★★★ Passable but not outstanding image and color.	★★★ Controls are complicated.	★★★½ Hurdles high resolutions with ease.	★★★ It's expensive for what you get.
Optiquest 2082DC Optiquest *Reader Service No. 809*	$1,399	20-inch shadow mask	0.28	1,600 by 1,200 at 60Hz	★★★ Clear colors, but small type had us squinting.	★★★ Controls are flimsy, but clearly labeled.	★ Barely passed MPR-II emissions test.	★★½ We like the low cost, but design needs work.
ErgoView 210 Sigma Design Systems *Reader Service No. 810*	$2,499	21-inch shadow mask	0.28	1,600 by 1,200 at 72Hz	★★ Colors look good, but focus falters.	★★★ LCD controls are adequate.	★ Failed the MPR-II emissions test.	★★ Too many quirks to recommend.
Mag MX 21F Mag Innovision *Reader Service No. 811*	$1,800	21-inch shadow mask	0.28	1,600 by 1,200 at 60Hz	★★ Poor contrast and focus; colors are washed out.	★★ Cryptic controls, despite a descriptive LCD readout.	★★ A better tube would help.	★★ The price is right, but everything else needs work.

*ESTIMATED STREET PRICE UNLESS NOTED OTHERWISE.

Final Analysis: Select the Right-Size Screen for Your Applications

Proof in the Picture

Nothing improves your outlook on computing quite like stepping up to a larger monitor. It boosts your productivity by making higher resolutions possible, letting you view more information and more detail onscreen. The following are some answers to common questions.

Should I get a 17-inch monitor, or a 20- or 21-inch monitor? That depends on what you do—and how much you're willing to spend. With prices ranging from $599 to $1,249, 17-inch monitors are ideal for running Windows at 1,024 by 768 pixel resolution, if you work primarily with mainstream business applications. A 17-inch monitor lets you squeeze 30 to 50 percent more information onscreen than a 14-inch VGA display does, so you can easily have several application windows active at once. The larger screens also work nicely for single-page desktop publishing tasks at this resolution. Although all the 17-inch displays we tested also sync to 1,280 by 1,024 pixels, for resolutions any higher than 1,024 by 768, or for detailed two-page layout and design, you'll want to consider larger 20- or 21-inch displays, which are easier on the eyes. With prices ranging from $1,399 to $2,957 they're expensive, but can quickly pay for themselves in increased productivity.

What is dot pitch and why should I care? Measured in millimeters (mm), dot pitch (also called slot pitch on Trinitron-style tubes) is the distance between the pixels or dots of light displayed on a monitor's tube. All things being equal, the smaller the dot pitch, the tighter a monitor's focus and the crisper the image. All things rarely are equal, however, so a dot pitch specification alone won't tell you how good the image is—it's merely a starting point. Any 17-inch display you consider should have a dot pitch of 0.28mm or smaller; and any 20- or 21-inch monitor should have a dot pitch of 0.31mm or smaller.

Are price drops on large displays imminent? Don't expect big price cuts any time soon. A shortage on tubes and the rising value of the yen mean prices are only likely to go up, not down, by the end of this year.

DECISION MAKER

CHOOSE A **HIGH-RESOLUTION MONITOR** THAT SUITS YOUR NEEDS

1 Choose the factor most important to you. **2** Choose the next most important factor. **3** What size do you want? **4** For your needs, the best product to buy is . . .

Image Quality	Price	17-inch	Sony Multiscan 17sf
		20- or 21-inch	Diamond Pro 21TX
	Usability	17-inch	Nanao FlexScan T2-17
		20- or 21-inch	Nanao FlexScan T2-20
Price	Image Quality	17-inch	Optiquest 4500DC
		20- or 21-inch	ViewSonic 21PS
	Usability	17-inch	NEC MultiSync XV 17
		20- or 21-inch	Nanao FlexScan T2-20
Usability	Price	17-inch	NEC MultiSync XV 17
		20- or 21-inch	Nanao FlexScan T2-20
	Image Quality	17-inch	Sony Multiscan 17sf
		20- or 21-inch	Nanao FlexScan T2-20

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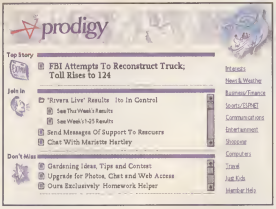

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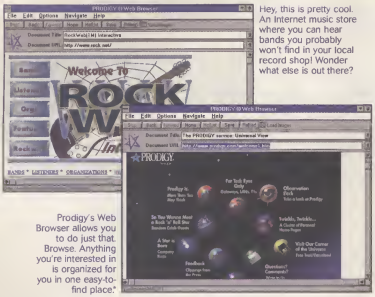

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Circle 184 on reader card.

The Fastest True-Color Cards

Pssst! Want to know the secret to faster Windows performance? It's not a high-speed 120MHz Pentium processor or a lightning-fast hard drive, although those certainly help. The real secret lies in the graphics accelerator. Put two systems with the same processor side by side, and the system with the brawnier graphics card invariably seems faster—often regardless of the amount of memory or the speed of the hard drive. This is so much the case that a 486 with a 64-bit local-bus graphics card can outclass a Pentium system with a standard but unremarkable graphics accelerator.

Why? Much of our perception of speed is based on appearances—how quickly things happen on a system's display. The time it takes a PC to draw and redraw an image on its monitor or scroll through documents affects how we perceive a machine's overall performance.

Most video cards offer resolutions of 1,024 by 768 pixels or higher, letting you view more information and detail on your monitor at a time—which means less scrolling and panning. Spreadsheets display more rows and columns. Documents appear as they will on a printed page, fonts and all (so you'll print fewer drafts). Some of the cards offer a virtual-display utility that lets you instantly pan across a larger area than your monitor can show all at once.

Image quality, moreover, is getting better all the time. All the video cards we tested can display a photo-realistic 16.7 million colors at resolutions of 1,024 by 768 or higher. Pick the right card and you'll have the perfect companion for a 17-, 20-, or 21-inch display.

BY WENDY TAYLOR

64-Bit Blasters: Taking a cue from the Pentium, virtually all of the newest graphics accelerators include a 64-bit processor. The processor speeds Windows' overall performance by freeing up the system CPU.

Room to View: Support for resolutions of 1,024 by 768 pixels and higher allow you to display more information onscreen at a time. Most of the boards we tested also sync to 1,280 by 1,024 pixels, a resolution practical only for 20- or 21-inch monitors.

True Colors: The more colors a graphics card displays, the more realistic photographs and other images appear onscreen. All of the cards we looked at display 16.7 million colors at resolutions of 1,024 by 768 and higher.

The PCI Edge: Most 486 and Pentium PCs now support the PCI local bus standard. Although some vendors continue to sell VESA local bus (VL-Bus) models of their cards, PCI now dominates the market.

PHOTOGRAPHS BY ERNIE FRIEDLANDER

Video-Card Showdown

Executive Summary

There's more to a good graphics card than a fast accelerator chip. As the results for these ten cards attest, the real difference is careful driver engineering. Software utilities for adjusting the resolutions and colors displayed also play a substantial part in a card's overall usability. Matrox's MGA Impression Plus stole the show in performance, usability, and image quality, followed by Number Nine's 9FX Motion 771 and Diamond's Stealth 64.

Are you squandering system performance on a second-rate graphics card? Whether you're weighing the graphics card options for a new system or looking for a way to breathe new life into the box on your desk, the right graphics accelerator can mean the difference between a good Windows machine and a great one.

All but one of the boards in this roundup include a 64-bit graphics accelerator chip. The lone exception: Radius's FireStorm 192 uses the older, 32-bit S3 Vision864 chip but puts three of these chips onto the board—one each for the red, green, and blue color channels. Number Nine's 128-bit accelerator, the Imagine128, is fast but pricey: it starts at $899 and works its way up to $1,600. The boards we tested here top out at $830, and most hover in the $449 range.

Highlights The hands-down performance leader was the MGA Impression Plus, thanks to Matrox's own MGA Power graphics accelerator and some carefully tuned drivers. Diamond's Stealth 64 came in a somewhat distant second, built around the S3 Vision968 chip.

Also important in our evaluation was ease of installation and usability. Mercifully, setting jumpers and dip switches during installation is a thing of the past. All of the video cards include software for selecting the resolution and colors you want to display, and for setting the vertical refresh rates (critical for eliminating migraine-inducing flicker). Kudos to Matrox, Number Nine, Radius, ATI, miro, and Diamond for providing real-time visual feedback, thorough documentation, and diagnostic tests with their boards.

Lasting Impression: The fastest card we tested, Matrox's $449 MGA Impression Plus, includes superb Windows configuration utilities and onboard 3-D acceleration.

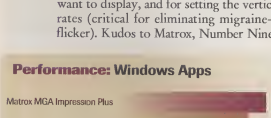
Lowlights Not all of the boards were a picnic to install and configure, however. Hercules's Graphite Terminator offers excellent Windows utilities, but first you have to get past the cryptic DOS installation routine. Actix's Graphics Engine 64's installation utility is adequate, but the Windows utilities are hard to navigate. Likewise, the utilities of STB's and Genoa's boards could offer more visual feedback.

Image quality was also a mixed bag. We hooked up all the cards to identical monitors and asked a jury to rate the image quality. The favorites were the boards from Hercules, Matrox, and miro, with honorable mentions to the boards from ATI, Genoa, Number Nine, and Radius. Actix's and STB's boards, however, were disappointing; colors were anemic and focus suffered.

Finally, we also tested the boards for video-playback quality. Running the cards under Video for Windows 1.1, we looked at each card for speed of playback as well as smoothness and clarity of picture. The top performers here were STB's and Number Nine's boards; the cards from ATI, Actix, Diamond, and miro delivered choppy, grainy playback.

Rarely does everything come together so neatly as it does with Matrox's MGA Impression Plus. Not only is it the fastest board we tested, it's the most usable and it offers first-rate image quality. And now for the best part: It's also among the most affordable.

Performance: Windows Apps



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Rating High-Resolution **Graphics Accelerators**

How They Measure Up in Our Lab Tests

Product	Price*	Chip	Performance	Usability	Technology	Verdict
MGA Impression Plus Matrox Graphics (800) 361-1408 *Reader Service No. 731*	$449	MGA Power	★★★★★ The fastest—by a wide margin; unparalleled image quality.	★★★★★ Excellent Windows utilities, including a virtual display.	★★★★★ Advanced 3-D acceleration built into processor.	★★★★★ The top choice for speed and usability.
Number Nine 9FX Motion 771 Number Nine Visual Technology Corp. (800) 438-6463 *Reader Service No. 732*	$499	S3 Vision968	★★★★½ Third overall, though Number Nine's pricier, 128-bit board offers blazing speed.	★★★★½ Lots of graphical feedback from the utilities.	★★★★ High-end components and finely tuned drivers.	★★★★½ Great utilities, standout video playback, and high usability make this a fine choice.
Stealth 64 Diamond Multimedia Systems (800) 468-5846 *Reader Service No. 733*	$449	S3 Vision968	★★★★½ Second only to Matrox's MGA Impression Plus.	★★★★★ Top-of-the-line Windows utilities.	★★★★ Cutting-edge components.	★★★★½ Fast, usability-approved, and affordable.
Graphics Pro Turbo ATI Technologies (905) 882-2600 *Reader Service No. 734*	$499	ATI Mach 64	★★★½ No slouch, but still not at the head of the pack.	★★★½ Resolution switching on the fly.	★★★★ Well-tuned drivers.	★★★½ A fine contender but on the pricey side.
Graphite Terminator Hercules Computer Technology (800) 532-0600 *Reader Service No. 735*	$449	S3 Vision964	★★★½ At the high end of the middle in speed; a favorite in image quality.	★★★½ Fine Windows utilities, but cryptic DOS installation routine.	★★★ Uses the older S3 964 chip.	★★★½ Not a bad choice if you don't mind a few quirks.
miroCrystal 40SV miro Computer Products (800) 249-6476 *Reader Service No. 736*	$469	S3 Vision964	★★★½ Middling speed; nice image quality.	★★★★ Easy-to-use utilities.	★★★ Uses the older S3 964 chip.	★★★½ Nice image quality, but there are faster boards out there.
FireStorm 192 Radius (800) 227-2795 *Reader Service No. 737*	$830	S3 Vision864	★★★½ Holds its own with three 32-bit processors.	★★★★ Excellent color and resolution utilities.	★★★★ Unusual three-chip design.	★★★ High marks for performance and usability, but too pricey for most users.
Velocity 64V STB Systems (800) 234-4334 *Reader Service No. 738*	$499	S3 Vision968	★★★½ Squarely in the middle.	★★★ Not much new here, but the utilities get the job done.	★★★ Better drivers and utilities would help.	★★★ This board's image quality was subpar, but its motion-video playback was exceptional.
VideoBlitz IIIAV Genoa Systems Corp. (800) 934-3662 *Reader Service No. 739*	$629	S3 Vision968	★★★ Solid but not standout.	★★★ Adequate utilities, but more visual feedback would be nice.	★★★★ High-end solid components and drivers.	★★★ Pricey for its class.
GraphicsEngine Ultra 64 Actix Systems (800) 927-5557 *Reader Service No. 740*	$475	S3 Vision964	★★½ Brings up the rear in performance and image quality.	★★ Utilities are hard to navigate.	★★ Poorly engineered drivers hamstring components.	★★ Too much work for too little payoff.

*ESTIMATED STREET PRICE.

Software Drives the Show

Any way you look at it, video counts. Whether you're choosing a graphics option for a new system or simply want a graphics card worthy of a new monitor, a high-resolution accelerator can make all the difference. Here are some answers to the questions our tests raised.

What's the secret to a good graphics card? A fast graphics chip like Matrox's MGA Power or S3's Vision968 is important, but the real secret is careful software-driver engineering. The boards from Diamond, Genoa, Number Nine, and STB all use the S3 Vision968 chip, for example, but the boards from Diamond and Number Nine proved substantially faster than the others. The included software utilities also play a substantial part in a card's overall usability. Matrox's MGA Impression Plus garnered perfect scores in performance, usability, and image quality.

How much video memory do you need? The amount of memory you need depends on the resolution and color you want to display. You need a minimum of 1MB of memory to display 256 colors at 1,024 by 768 pixels at flicker-free refresh rates (72Hz or higher). For higher resolutions and for displaying photo-realistic images with 16.7 million colors, however, you'll want 4MB of video RAM (VRAM).

What's the advantage of VRAM over dynamic RAM (DRAM)? Speed. When displaying standard 640-by-480–pixel VGA resolution with just 256 colors, the performance differences between VRAM and DRAM are negligible. When higher resolutions and 24-bit color come into play, however, DRAM isn't fast enough to keep up. Although boards with DRAM are cheaper, you'll want a board with VRAM if you plan to take advantage of a board's higher resolutions and color options. Also, look for new memory technologies to improve video performance without increasing cost. Matrox, for example, recently announced the MGA Millenia, which uses WRAM, or window RAM. A shipping version of the Millenia was not available for this review, but early tests showed it to be even faster than the Matrox Impression Plus.

DECISION MAKER

CHOOSE THE RIGHT HIGH-RESOLUTION **GRAPHICS ACCELERATOR**

1 Choose the factor that's most important.	2 Choose the next most important factor.	3 What else is important?	4 For your needs, the best product to buy is . . .
Price	Performance	Image Quality	Matrox Impression Plus
		Video Playback	Number Nine 9FX Motion
	Usability	Image Quality	Diamond Stealth 64
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Performance	Price	Image Quality	Matrox Impression Plus
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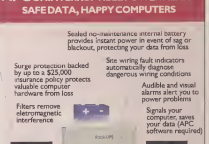

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Ravi Iyer, Software Galleria

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Kurt Roemer, Searle Corp.

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		Image Quality	Diamond Stealth 64
Performance			
Usability			

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In fact, you have better odds of winning the lottery than of escaping the sting of power problems on your PC. One study discovered at typical PC is hit over 100 times a month, causing keyboard lockups, hard drive damage, and worse. And since sags and blackouts represent more than 85% of power problems likely to hit your computer, standard surge suppressors are literally power-less to protect you. And a study in a recent PC Week showed that the largest single cause of data loss is bad power, accounting for almost as much data loss as all other causes combined.

PROTECT YOURSELF BEFORE YOU KICK YOURSELF...

Get instantaneous battery backup power from an APC Uninterruptible Power Supply and prevent keyboard lockups, data loss, and hard disk crashes. Surge protection performance is even backed by up to a $25,000 Lifetime Equipment Protection Guarantee.

Ask for APC at your computer reseller today or call for your FREE handbook. Starting at just $119, an APC UPS is serious protection no serious computer user should be without.

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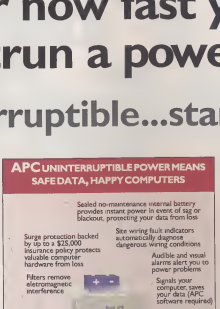
APC UNINTERRUPTIBLE POWER MEANS SAFE DATA, HAPPY COMPUTERS



APC Uninterruptible Power Supplies provide instant battery backup to protect your data from loss and your hard drive from damage. Units are even backed by up to $25,000 in lifetime surge protection insurance.

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"This is the best computer related purchase I have ever made! Has saved me hours of re-programming..." **Carol Irvine, Wizard Assoc.**

"We reduced our maintenance costs the first year by 50% in repairs of equipment." **Valentin Gonzales, Pfizer**

"Our server was running a project when it lost power... messed up all the data files. It took four days to recover. But we don't worry anymore since we got APC..." **Tony Chen, DeAnza Systems**

"We were working on a state bid when the power went off. APC saved the day and year and future...about 800 pages of data saved thanks to APC." **Ravi Iyer, Software Galleria**

"A power surge did significant damage to all of our systems except those protected by APC. The APC units were undamaged..." **C. Jeffrey, C. Jeffrey Eng.**

"APC has virtually eliminated downtime in our corporate network..." **Kurt Roemer, Searle Corp.**

"Power went out while processing payroll! If not for APC we would have had a walkout!" **Suci Higgaston, OSI Inc**

"Thanks to APC's Power Chute Plus software, we can now shutdown our UNIX Solaris machines without a doubt. Influence, I can't wait to see Unix-compatible software blooded..." **Jim Wood, Sr. Dev. Engineer, Cognex Corp.**

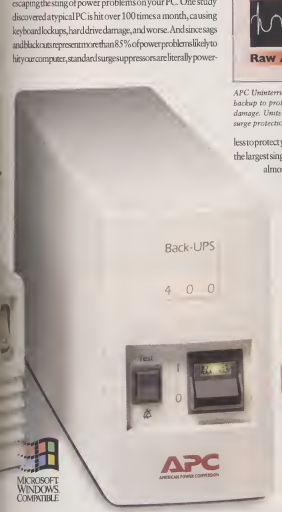
"APC saved our bacon when a power surge fried our computer. All the lost sales gets on the plane at 8:00 a.m? You should assume that you'll buy a UPS, not that it's some luxury item." **R. Morello**

"A power surge wiped out the FAT tables on all PC's not protected by APC. Now have APC installed on all..." **Craig Post, Comm. Tech.**

"Before I purchased the UPS I had to put in at least two hard drives at $1000. With APC products...no new hard drives in two years!" **S. Foreman, LSP**

FREE 60-PAGE HANDBOOK

What are the causes and effects of power problems? The most common power protection mistakes? Call for your free handbook today! Please reference Dept E7.



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Perfect Pages Made Easy

SYNOPSIS

PAGE MAGIC: *A solid product, aside from a few quirks here and there.* **166**

PAGEPLUS: *Loaded with plenty of bells and whistles, but it's the hardest to use among the products we tested.* **167**

PUBLISHER: *Designed from the ground up with the user in mind, it's the most productive and satisfying.* **168**

USABILITY LABS REPORT: *Usability testers rate the products.* **170**

FINAL ANALYSIS: *It's an unprecedented clean sweep for Microsoft Publisher.* **172**

Flyers, brochures, newsletters, business reports: They're tried and true means of promoting your small business or corporate department. But lively documents depend on inventive layouts, which all too often strain the most graphically gifted word processor. Try to continue a newsletter story from page 1, column 2, to page 4, column 3, in Microsoft Word, and you'll see why we suggest you spring for one of the three inexpensive page-layout programs we tested in *PC Computing*'s Usability Labs: Microsoft's Publisher 2.0, Serif's PagePlus 3.0, and New England Business Service's Page Magic 1.1.

Unless you want to split hairs over bells and whistles, we found that any of these inexpensive packages lets you create enticing documents for your home or business. But the big question is, how easily? To answer that, we filled our Usability Labs with businesspeople who had experience performing basic desktop publishing tasks using word processors. Each tester attempted to create a 1-page flyer and a 3-page newsletter from sample documents.

The results were clear: Microsoft's Publisher 2.0, with its well-organized menus and layers of online help, was the all-around favorite. Page Magic 1.1—simple, straightforward, and competent—was deemed acceptably easy to use. In contrast, our testers found PagePlus 3.0 downright irksome in most areas, despite the program's flashy feature set.

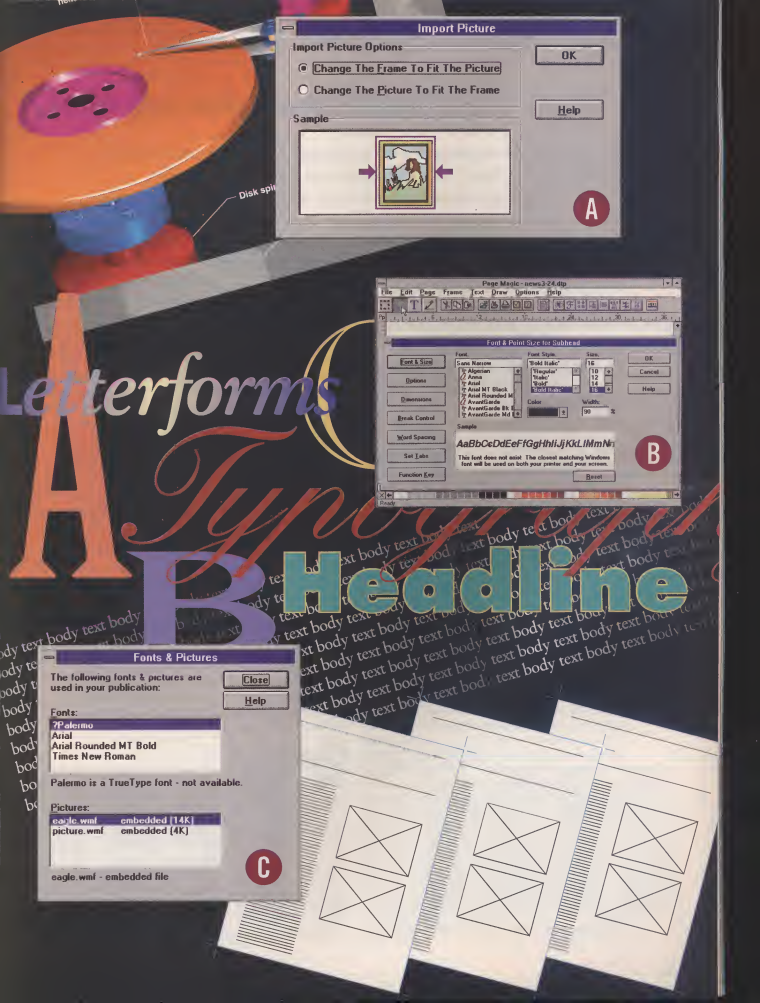
What about the high-end desktop publishing products? Sure, if you have time to train for a second career in graphic design, a high-end package like Adobe's Aldus PageMaker, Corel's Ventura Publisher, or Quark's QuarkXPress will let you create top-notch professional publications. These programs offer advanced features that you most likely won't need to produce simple documents. They're certainly not for casual users who want a program that's inexpensive, easy to learn, and hard to forget when they're not using it on a daily basis.

A EASY FIT: Microsoft's Publisher makes importing graphics quick and painless—the way it should be.

B STYLE MAGIC: Choosing fonts and refining styles is a piece of cake with Page Magic's paragraph style menus. The handy dialog box contains all of the elements you'll need to present your words at their best.

C CHECK IT: PagePlus lets you take a quick census of your document's fonts and graphics to make sure they'll print correctly.

BY BOB WEIBEL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Import Picture
Import Picture Options:
Change The Frame To Fit The Picture
Change The Picture To Fit The Frame
OK
Help
Sample
A
Page Mode - news3-24.dp
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Font & Point Size for Subhead
Font & Size
Options
Dimensions
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Word Spacing
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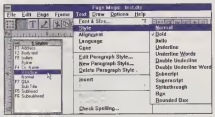
Font:
Times Narrow
Algerian
Arno
Arial
Arial M1 Black
Arial Rounded M
AvantGarde
AvantGarde Bk E
AvantGarde Md E
Font Style:
"Bold Italic"
"Regular"
"Italic"
"Bold"
"Bold Italic"
Size:
16
10
12
14
16
OK
Cancel
Help
Color
Width:
90 %
Sample
AaBbCcDdEeFfGgHhIiJjKkLlMmNn
This font does not exist. The closest matching Windows font will be used on both your printer and your screen.
Reset
B
Letterforms
Typography
Headline
Fonts & Pictures
The following fonts & pictures are used in your publication:
Close
Help
Fonts:
?Palermo
Arial
Arial Rounded MT Bold
Times New Roman
Palermo is a TrueType font - not available.
Pictures:
eagle.wmf embedded (14K)
picture.wmf embedded (4K)
eagle.wmf - embedded file
C

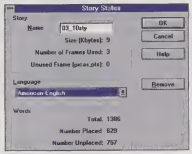
Page Magic: Simple, Accessible, and Quirky

If it weren't for troublesome text import and autoflow quirks, NEBS's Page Magic 1.1 might have rated closer to the leader, Microsoft's Publisher. But most testers stumbled over needless impediments. Those who worked on a three-column newsletter template, for example, found that after selecting the correct text frame, the imported text file ended up in a new, unwanted frame. Page Magic had automatically turned on the Create Frame option, located inconspicuously at the bottom of the Import Text dialog box—despite the fact a text frame was already selected. Even after testers deselected this illogical option setting, the imported text still didn't show up in the frame. The clue to the problem appeared at the bottom of the online help page for importing a story: You can't import a story into a frame containing another item, such as text entered from the keyboard. Clever testers realized that the Ghost Styles provided in the template frames to indicate recommended paragraph styles were actually return characters that had to go. Gotcha!

Text Import Blues: Even with the correct frame selected, Create Frame (lower left) remains turned on so that imported text flows into a small frame (upper left). But once you deselect the option, the text file still won't import because the frame contains template text that you must first delete.



Style Snarl: Paragraph mode lets you apply character styles only if you've turned on the story Browser.



True Story: The Story Status dialog box saves you from guessing the fate of imported text files.

Lab Notes

Try to import some text. We dare you. Page Magic gave our testers no clue when text wouldn't import or flow predictably from frame to frame. This was unexpected because graphics import was a snap.

What Testers Said about Page Magic

"It took me a while to discover I couldn't import text into a frame that already had something in it."
SMALL-BUSINESS OWNER

"It was deceptively easy at first, but when I tried to manipulate imported text, it got pretty hairy."
MARKETING COORDINATOR

Page Magic's text autoflow feature proved equally annoying. Testers wanted to flow text automatically from the first column through the third column and felt inclined to immediately select the Autoflow Text command from the Text menu. However, Page Magic ignored the remaining columns on the opening page and flowed the text into the first columns of the following pages, adding many unwanted pages. You must manually flow the three columns of text on the first page, then leaving the third column selected, and—only then—click on the Autoflow Text command.

Importing and scaling graphics, creating text callouts, and other special operations go pretty smoothly. Double-clicking on a paragraph in Paragraph mode brings up an especially handy paragraph-style dialog box. Several important pop-up menus, such as paragraph styles, appear only when you've opted to show the Browser—not too intuitive, and a puzzle to many testers. Page Magic has the makings of a solid product if it can overcome these pitfalls in its next version.

SUMMARY

	Import Text	Text Flow and Word Wrap	Import and Scale Graphics	Add and Manipulate Text
Satisfaction	Needlessly annoying.	Could have been better.	Smooth sailing.	A nice, easy feel.
Productivity	Presents major roadblocks.	Often more hassle than help.	Quick and painless.	No major problems.
Help System	Much needed, little provided.	It just gets you more confused.	Usually there when needed.	Take it or leave it.
Verdict	★★★½	★★½	★★★★½	★★★★

★★★★★*Excellent* ★★★★*Good* ★★★*Acceptable* ★★*Poor* ★*Unacceptable*

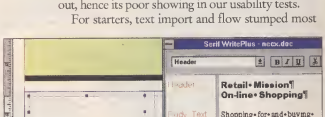
PagePlus: Power, Three Menus Deep

You should have seen the change in facial expression as tester after tester, initially buoyed by PagePlus's glittery display of so-called "Assistants" and clever "tips" and "hints," struggled mightily once they got down to business. In short, PagePlus has a lot of decent features that are sabotaged by poorly structured menus and ineffective onscreen guidance and feedback. Contrary to Serif's claims, the program simply takes too long to figure out, hence its poor showing in our usability tests.

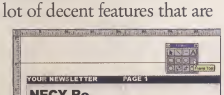
For starters, text import and flow stumped most testers. For example, the Text Frame creation tool always drags out a two-column frame by default. A glitzy Frame Assistant pop-up menu is really no help at all. It offers the same text-input choices as the regular PagePlus menus, and still fails to prompt you for the number of columns you want. Much later testers discovered they could change the default setting.

More than anything, the menu structure of PagePlus stymied the testers. The dialog box for creating and editing paragraph styles is hidden three menu levels deep: You have to go through Tools, Default, and Styles to find it. Having created text-callout frames or imported graphics, testers also had trouble creating text wraps, not because PagePlus's text-wrap feature isn't simple and effective, but because it's tucked under the Tools menu, and not associated with the Frame Setup dialog box.

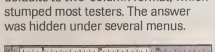
PagePlus also insists on treating each paragraph of text—even lengthy, columnar text—as a separate text block that you can click and drag independently of the surrounding text. Other than for short, punchy flyers, this level of freedom is a prelude to anarchy, because it's too easy to grab a block and move it out of position. If you drag it even slightly beyond the frame boundary, the paragraph disappears from the text story. Learning how to put things right, as with most of the features, requires carefully studying the manual—a usability kiss of death. Many of the features could be of great use, if only it weren't such a struggle to find and use them.



Where's the Text? The header and subhead appear in the WritePlus text editor module, but not in the layout—an occasional frustration. When the header and subhead became linked under a single style, it took a call to tech support for us to discover how to fix it.



Column Surprise: The Frame Tool defaults to two-column format, which stumped most testers. The answer was hidden under several menus.



Watch It: PagePlus makes it easy to accidentally grab and misplace a separate text paragraph, creating overlaps like the one above.

Lab Notes

Despite appearances, PagePlus proved to be no quick study.

What Testers Said about PagePlus

"I found myself switching back and forth between screens and the main menu to look for help or direction to solve my problems. But I kept coming back to the same confusing help screens."
CONSULTANT

"It wasn't intuitive to me how to form the frames, wrap text around them, or do three-column work."
SYSTEMS ANALYST

"There appeared to be extra steps involved in placing graphics, but it was not clear how to do that."
DEVELOPMENT ENGINEER

SUMMARY

	Import Text	Text Flow and Word Wrap	Import and Scale Graphics	Add and Manipulate Text
Satisfaction	Options and consequences aren't obvious.	Fine, if you like reading manuals	Tricky to figure out, but easy once learned.	Bewildering and unforgiving.
Productivity	Good, but hard to get started.	OK, after a tough start.	Quick and efficient.	An obstacle course.
Help System	Good, and quite necessary.	Much needed, but almost useless.	Not clear enough.	Needs work.
Verdict	***	**	***½	**½

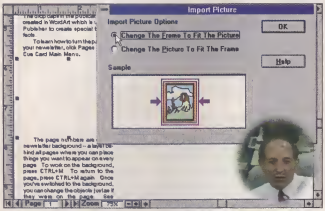
*****Excellent ****Good ***Acceptable **Poor *Unacceptable

Publisher: DTP the Way It Should Be

While competing vendors have attempted to slap a little ease of use onto the skin of their products, Microsoft's Publisher is engineered from the ground up for your page-layout comfort. No wonder testers rated it significantly higher for every task category tested. At the core of the program are Publisher's Wizards, which actually do what you tell them to do—unlike the other products' hints and tips, which tell you what to do. The Startup Wizard, for example, asks you some basic questions about the type of document you want, then builds a custom template. Publisher's Cue Cards are the second line of assistance, providing choices of relevant tasks as well as the how-to for each step of the way. Finally, Publisher has several layers of online help, including a CD-ROM–based user's guide. There are even "first time" hints that sense when you're attempting a certain task—such as creating a table—and guide you through step by step.

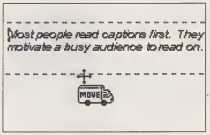
In fact, the entire menu structure and screen interface is designed to never leave you hanging, and our testers were rarely left on their own. Few dialog boxes are located more than one menu deep, so you can easily find the features you need. Alert boxes pop up to let you know the possible results of your actions, so you can decide what to do. Our testers had little trouble with text flow because they were alerted when imported text didn't fit a frame. They were offered options for flowing text (autoflow being one of them), and then informed where the text had flowed, moving the testers to any newly generated pages and calling out where the testers were and what had happened—which means no surprises.

Testers didn't falter when it came to importing text or graphics, either. Drag out a text block for a callout, and the text insertion point is ready for you, the surrounding text is already wrapped, and the link icon is visible. In contrast, with PagePlus you have to struggle with every aspect until you know all the quirks. Instead of fighting with the user to complete a task, Publisher guides the user all the way.



You Can't Miss a Step: Publisher's picture frames are automatically set to wrap text, so you just have to decide on scaling. Need additional text wrap and scaling options? They're easy to access. Testers raved, rating these graphic import features excellent overall.

Do the Right Thing: Publisher helps you avoid mistakes along the way and points you in the right direction.



Conspicuous Cursors: Your mouse will do less mischief with Publisher's no-guesswork graphical cursors.

Lab Notes

Publisher was a push-button pleasure, performing the tasks our testers expected and providing help at most critical junctures.

What Testers Said about Publisher

"It does the text wrapping automatically as soon as I create the picture frame."
LAB TECHNICIAN

"Microsoft's Publisher was the only program in which I was able to complete the three-column exercise."
CONSULTANT

"The importing of text is very powerful, and the autoflow feature from text frame to text frame is automatic. The system [indicates] whether it is a valid text frame or not."
SYSTEMS ANALYST

SUMMARY

	Import Text	Text Flow and Word Wrap	Import and Scale Graphics	Add and Manipulate Text
Satisfaction	Couldn't be easier.	Solid, with no surprises.	In a word, *awesome.*	Painless, with attractive results.
Productivity	Maximum results.	Quick and sure.	Truly a point-and-click system.	A one-step operation.
Help System	OK, but not required.	Well-indexed and relevant.	Testers didn't have to use it.	There when you need it.
Verdict	★★★★½	★★★★	★★★★★	★★★★½

★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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If you can *dream* it, you can *do* it.™

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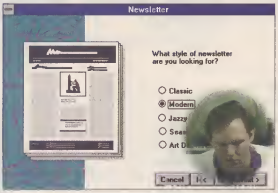
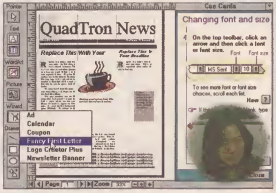
Circle 111 on reader service card.

The Most Usable Software

Microsoft's Publisher 2.0 sets a fresh standard for the way all mass-market productivity software should be designed: with the user in mind. Microsoft obviously spent a significant amount of time and energy studying the page-layout process and the way the average professional—not the trained graphics designer—approaches the tasks. No wonder our testers favored Publisher by a clear margin. It was rare if a tester paused for long to figure out what to do next, or pondered how to recover from the unexpected results of applying a feature. Whether it was importing text or graphics, flowing text into columns, doing basic page setup, or creating special text elements such as callouts, Publisher applied the feature—in one or two clicks—the way most people would expect it to. It's hassle-free desktop publishing with help nearby if you need it.



Wonderful Wizards: Publisher's Startup Wizard asks for layout ideas and then creates a template. Other wizards can help you create everything from company logos and business cards to tape cassette covers and banners. The Windows 95 version, due out this fall, promises even more Wizards. ★★★½



The Helping Hand: Stumped? No need to be with Publisher. It rarely leaves you wondering what to do next or how to do it. Cue Cards relate to the task at hand, not just features, and walk you through the process. They help you work through the specific task, whereas Wizards actually perform the tasks. ★★★½

SATISFACTION: *Publisher keeps you relaxed and on track by eliminating confusion, frustration, and trial-and-error desperation. A clean screen layout and simple menus help you avoid mistakes.*

PRODUCTIVITY: *Publisher's sensibly organized features and multi-level help keep you from stalling, especially when you're just starting out or if you use the program infrequently.*

HELP SYSTEM: *None of the competitors' help systems surpasses Publisher's. The CD-ROM–based user's guide, Cue Cards, and alerts are there to help with your task at hand.*

SUMMARY: *Frustration with software wastes time and mental energy. Not so with Publisher. It's designed from the roots up to spare you needless churn and burn—hence our testers' rave reviews.*

Lab Notes: What Testers Said about Desktop Publishing Software

Publisher

"Publisher tells you what it's doing while it's creating the newsletter from scratch using a Page Wizard, and that's a nice feature. And if you're already familiar with a word processor such as Microsoft Word, then it's an easy product to learn."

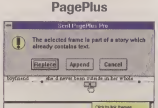
PRODUCT DEVELOPMENT ADMINISTRATIVE SPECIALIST

Page Magic

"I like the fact that Page Magic proportioned the picture I imported relative to the original, so that when I scaled the frame out of proportion, white borders appeared between the border and the image."

LAB TECHNICIAN

PagePlus



"I didn't get PagePlus figured out in time. It was very difficult to pick up. Some of the features, such as linking, were not very intuitive and were very hard to use. I had to go through the online help."

SYSTEMS ANALYST

SCORECARD DTP STAR: MICROSOFT'S **PUBLISHER**

Task	Microsoft Publisher 2.0	NEBS Page Magic 1.1	Serif PagePlus 3.0
1. Import Text *Weighting: 25%*	★★★★½ The sensibly designed interface spares you lots of grief and confusion.	★★★½ It has the right idea, but needless quirks may lead you astray, especially if you use templates.	★★ Doesn't provide sufficient clues to where your text is going: into a frame or as "free" text blocks.
2. Text Flow and Word Wrap *Weighting: 25%*	★★★★ Graphics and text frames automatically make text wrap around them. Helps you keep flowing text under control.	★★½ Enough hairpin turns to guarantee you'll have text everywhere except where you want it. Must learn the ropes.	★★ You'll eventually master the menus and gain proficiency, but it's too easy to grab and move the wrong things.
3. Import and Scale Graphics *Weighting: 25%*	★★★★★ So easy that not one tester used the online help. Simple but effective feature options are the keys to success here.	★★★★½ Sensibly designed import feature automatically wraps text and preserves graphics' height-width ratio as it autoscales them to frame.	★★★½ Importing wasn't tough, but moving and scaling proved clumsy. Proportional resizing was trickier than it should have been.
4. Add Special Text and Boxes *Weighting: 25%*	★★★★½ Easy as pie. When you drag out a text frame, the surrounding text automatically wraps, and the new frame's text entry cursor is ready.	★★★★ Easy as quiche. Frames, handles, and associated cursors aren't quite as foolproof as Publisher's counterparts, but they're still handy.	★★½ Drag out a text box, change tools to select box, undo dual-column default, fiddle with wrap settings, then struggle to get the cursor in the frame.
Verdict *100%*	★★★★½ Software small office folks dream of. Any other choice means harder work.	★★★½ Simple and straightforward, Page Magic's magic was marred by a few quirky features.	★★½ One tough nut to crack. PagePlus desperately needs an interface redesign to live up to its potential.

★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

The Script

For every feature story that includes usability testing, we design a script that consists of a set of common tasks. We report test results in three key areas: user satisfaction, productivity, and help. The satisfaction score reflects the testers' preferences on a scale of one to five (five is best). The productivity score reflects the percentage of tasks completed. And, the help score reports the percent of a program's references to documentation and online help that actually assisted the testers.

How We Tested

To evaluate the products, we brought in usability testers who were not DTP professionals, but had done basic DTP using word processors. Each tester worked through the same tasks, which took a total of about ten hours to complete. While the testers were at work, we observed them, timing their responses and videotaping their reactions. As always, we encouraged testers to think out loud (you'll find their comments throughout this article). Finally, the testers rated their experience with the software subjectively in a debriefing session at the end of each day.

How to Contact

Page Magic 1.1 / $80 est. street price / New England Business Service / (800) 882-5254 / *Reader Service No. 750*

PagePlus 3.0 / $120 est. street price / Serif / (800) 697-3743 / *Reader Service No. 751*

Publisher 2.0 / $95 est. street price / Microsoft / (800) 426-9400 / *Reader Service No. 752*

Final Analysis: An Easy Choice—It's Publisher

Publisher Prevails

Microsoft's Publisher not only accomplished all of the tasks our Usability Labs put it through, it's the product we recommend in every branch of our decision maker. And that's something we've *never* seen before with any other product we've reviewed. No matter what you're looking for in an entry-level desktop publishing product, Publisher is the hands-down choice. Simply put, this program puts your comfort at the core of its code. The Startup Wizard, for example, queries you about the document you're planning, then builds a detailed custom template. Other Wizards create custom calendars, ads, logos, banners, coupons, and other things—all at your command. In contrast, PagePlus's Assistants are gaudy menus that do little more than mimic selections you can make in standard menus. And the plethora of pop-up tips fail to penetrate the program's quirky maze of features. Not that PagePlus doesn't work; our testers simply found it too tough to learn, and not worth the effort. It earned a usability score only a hair better than poor.

Publisher's many kind touches make a big difference. It warns you of the consequences before you make a big move, guides you through the task, and lets you know what happened after it's done—especially helpful with text autoflow. Onscreen objects are kept simple and functional so that you know what you're grabbing and what will happen by as a result of your action—a super-explicit graphical mouse cursor also helps. In contrast, PagePlus requires much care and concentration to avoid grabbing the wrong object and accidentally resizing something you wanted to move, or dragging text instead of its frame. Testers were often in trouble.

NEBS will ship a new release of Page Magic by the time you read this. The new version will probably still face a tough challenge from Publisher, but if NEBS manages to iron out a handful of pesky kinks, the product's solid and sensible nature will make a better showing. But Publisher's ability to think ahead for you puts it a star ahead of Page Magic 1.1.

BOB WEIBEL *is the coauthor of* Desktop Publishing Secrets *and* Quark XPress Book, Windows Edition.

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Text Import & Placement	Controlled Text Flow	Easy Column Linking	Microsoft Publisher 2.0
		Dynamic Link Control	Microsoft Publisher 2.0
	Good Feedback	Helpful Warnings	Microsoft Publisher 2.0
		Clear Screen Design	Microsoft Publisher 2.0
Graphics & Special Text Objects	Automatic Text Wrap	Easy Borders	Microsoft Publisher 2.0
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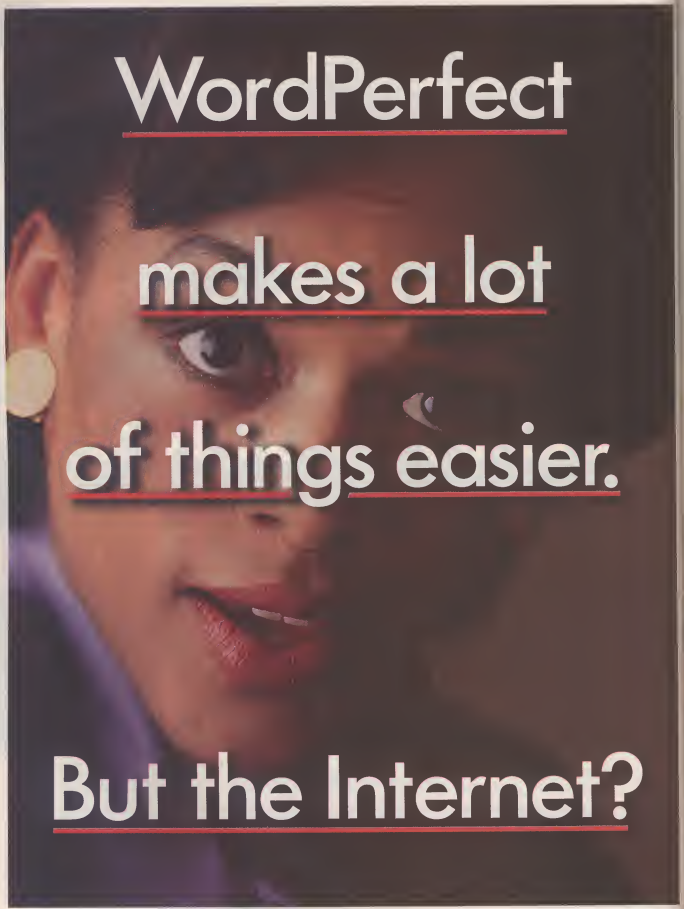

*WordPerfect Internet Publisher is not available in stores. Once you've purchased WordPerfect 6.1, you can download it free from your favorite on-line service, from our Internet server at http://www.novell.com or from the WordPerfect electronic bulletin board at 1-801-225-4414. Or call us at 1-800-861-2554 and we'll send you disks for a nominal fee. Internet Publisher only works with WordPerfect 6.1 for Windows and does not include an Internet connection.

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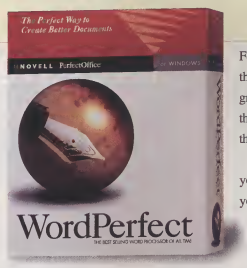

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Dial-Up Desktop

Call it the Catch-22 of mobile computing: The easier it gets, the harder it gets. If you thought taking your notebook home at night or working on the PC in your den in the evening would buy you some quality time to finish the day's work in peace, think again. Now that it's easy to store your work in a notebook and take it on the road, you're expected to stay in constant contact with everyone back at headquarters. Every advance that makes it easier to work remotely translates quickly into greater pressure to stay better connected.

Addressing that need, Windows 95 promises to improve the remote-access experience by building basic functionality into the operating system. Will it bring glitchless LAN connections to mobile workers dialing in from afar? Will dedicated remote-access products become unnecessary? Will remote access finally become a painless plug-and-play process? Don't kid yourself.

To be fair, Windows 95's Remote Access Services (RAS) is a well-crafted module that allows mobile workers to dial into an array of servers, including Novell's NetWare, Microsoft's Windows NT, and anything running TCP/IP. This is especially true if your server is running Windows NT. RAS patches the client into an NT network as if the client were a PC attached by a cable. In other words, you have all the privileges your LAN connection offers, including the ability for others to tap into shared resources on your PC. You can even establish a DDE link over a phone line.

But if you think your headaches will vanish when you try to access files across a phone line, run applications remotely, or swap e-mail and update group schedules, you might be in for a surprise. Most of us won't be dialing into NT servers. And we won't all be switching to Windows 95 right away, either. That's why we also evaluated the array of remote-node and remote-access options that can solve your problems for any mix of network servers and client operating systems. Though none of the solutions presented here is perfect, each can help you stay a jump ahead in the remote-access game.

BY MARTY JEROME

Gain **Complete** Access

You're away from the office and need full access to your company's network as though you were at your desk. You need to get at files, collect e-mail, check your schedule, and run some applications. Impossible? Windows 95 offers at least some relief. Its Dial-Up Networking Wizard, for example, expedites connections by letting you specify the modem, phone number, and host server for a particular connection. Double-click, drum your fingers a few times, and suddenly you're prompted for your user name.

With Windows NT Server, you can have Windows 95 clients hook into the network as if you were a remote node. But for dialing into other networks, you may need a third-party dial-in server solution, such as Shiva's LANRover or Microcom's LANexpress.

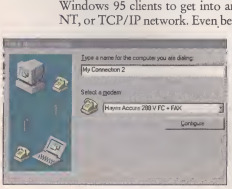
Inbox

WINDOWS 95 WITH WINDOWS NT 3.5

The **Easiest** Connection

In building a Remote Access Services client directly into Windows 95, Microsoft gives mobile workers vast file-sharing capabilities. By building the server directly into Windows NT 3.5, Microsoft gives mobile workers actual workgroup capabilities from the road. Make no mistake: With Windows 95 and Windows NT, you can do just about anything across a phone line that you can do from the LAN connection on your desktop.

Thanks to Windows NT's powerful routing technologies, a Windows NT server can act as a superb gateway for Windows 95 clients to get into any NetWare, Windows NT, or TCP/IP network. Even better is the high usability that this combination of Windows 95 and Windows NT brings to the party. All you need is the phone number of the NT server you're trying to reach. Windows 95 negotiates the protocols and the connection type. You don't even need to specify a default-server type. Compare that with NetWare Connect's drab DOS interface, its fussy configuration, and its wide incompatibilities (LAN managers grow red with ire at the very mention of its name). A Windows version, release 2.0, is due later this summer, promising a much-needed overhaul; it remains to be seen whether that will be able to compete with the convenience of Windows 95 and Windows NT Server.



Is the Microsoft pairing a perfect solution? No, but it comes close. It's easy to set up, easy to administer, and pretty inexpensive (you supply the hardware—modems, computer, and so on—plus $279 for Windows NT 3.5). A major drawback of the current version, 3.5, is that it does not support Macintosh clients; Microsoft plans to add that feature in a future version of Windows NT.

FILEBOX

Windows 95 with Windows NT 3.5

Pros: Easy to configure; full workgroup capability.

Cons: Supports SPX/IPX, TCP/IP, and NetBEUI only.

Verdict: A cinch—especially if you already run NT Server.

Windows 95, $95; **Windows NT 3.5,** $279 est. street price.
Microsoft Corp.
(800) 426-9400
Reader Service No. 812

WINDOWS 95 WITH SHIVA LANROVER

Best Bet for NetWare

When it came time to build remote access into Windows 95, Microsoft turned to the pros—or rather, to the pro: Shiva. The company that pioneered remote-node access helped Bill's gang design Windows 95's Remote Access Services. Shiva's LANRover line of dial-in servers now offers seamless integration across a host of networks, including NetWare, Unix, and AppleTalk.

While you certainly don't need to use a LANRover server for file sharing, Shiva gives you plenty of reasons to consider it. Not only can you dial into the server, for example, but users can dial out as well (and send faxes too); thus you avoid the cost and hassle of installing data lines at every desktop.

In addition, LANRover supports ISDN connections, thus boosting lethargic file-transfer speeds over a phone line. A callback feature designed for security can actually reduce phone bills. And the client's full support for Windows 95—based on the Shiva-Microsoft collaboration—makes LANRover a powerful case for any NetWare local area network.

Network administrators like it too, not least because they can control several LANRover servers from a single workstation. Also, the product comes with a vast array of multilevel security features. Instead of storing names and passwords on the dial-in server itself, for example, LANRover stores them in the NetWare Bindery, thus reducing your LAN manager's annual aspirin bill.

True, LANRover isn't everyone's solution—there are still a few Banyan Vines, DECnet, and other networks that it can't help. But LANRover offers some features that surpass those of the Windows 95/Windows NT solution.

FILEBOX

LANRover

Pros: Seamless integration with Windows 95; dial-out capability; excellent security.

Cons: Limited remote control; doesn't work with every network.

Verdict: For NetWare, this is the way to connect.

$2,799 (two ports) to $119,988 (200 ports) est. street price
Shiva Corp.
(800) 458-3550
Reader Service No. 813

WINDOWS 95 WITH MICROCOM LANEXPRESS

Any LAN, Anywhere

When you have to gain access to a Banyan Vines network, a DECnet network, or an XNS network, turn to Microcom's LANexpress. This remote-access server supports nearly every protocol you can think of.

It's mercifully easy to install and configure: connect phone line, power cord, and network cable, then install the software. It makes your life easier, too: the client software automatically senses the operating system, type of network, and frame type. LANexpress also comes with a remote-control client for those times you want to remotely take control of a specific node on the network (see "Remote Control," page 182).

As anyone who has tried to shuttle a 24-bit graphics file or large database across a phone line can attest, performance is the most frustrating aspect of remote-node access. Performance is LANexpress's strong suit: it comes with an enhanced Windows driver to boost serial-port communication speeds. Of course, the program also works with a variety of modems, including first- and second-generation PC Cards.

On the server side, modems use a bus interface rather than a serial connection, thus eliminating bottlenecks. There's also ISDN to consider; LANexpress maintains consistent throughput even when multiple clients dial in simultaneously.

An even better reason to consider LANexpress? You may have no alternative: It supports a wider range of protocols, including Banyan Vines, DECnet, and XNS, than do Shiva's LANRover or Microsoft's Remote Access Services. LANexpress can't match Shiva's dial-out capabilities or its LAN-to-LAN connections, but for non-NetWare setups, it's a top-notch solution.

FILEBOX

LANexpress

Pros: Easy installation, top-notch performance.

Cons: No dial-out capability and no LAN-to-LAN access.

Verdict: Fast and easy to configure, and it connects to any LAN.

$3,499 (2 ports) to $11,899 (12 ports) est. street price
Microcom
(800) 822-8224
Reader Service No. 814

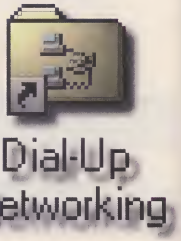
PHOTOGRAPHS BY GEOFFREY NELSON

Dial-Up Workgroups

So maybe you don't need access to your whole network. Windows 95 has a solution, called Microsoft Exchange, but it requires a server component that won't be finished until the end of the year. Meanwhile, there are two splendid alternatives available: Lotus Notes and Novell's GroupWise.

While few of us buy an e-mail and scheduling package based solely on the needs of mobile workers, no company buys one without considering what it offers employees on the road or working from a home office. E-mail providers have gotten the message.

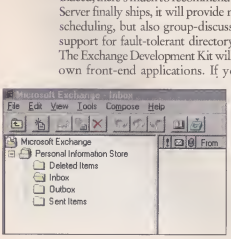
Microsoft, Lotus, and Novell each takes a different approach to e-mail and scheduling. Likewise, each offers different remote-access conveniences—and headaches.



WINDOWS 95 WITH WINDOWS NT 3.5

One-Stop Messaging

Microsoft has a funny way of giving you a new house for free, then selling you the land underneath it. No less with Windows 95, which features the client software for Microsoft Exchange. All you need to add is a Windows NT Server running Exchange Server on the network end. At least that's Microsoft's grand strategy. And indeed, there's much to recommend it. When Exchange Server finally ships, it will provide not only e-mail and scheduling, but also group-discussion databases and support for fault-tolerant directory synchronization. The Exchange Development Kit will let you build your own front-end applications. If you sense that this is a salvo aimed squarely at Lotus Notes, trust your instincts.



But if e-mail is all you need, Windows 95 already comes with Microsoft Mail, a very refined utility that can tap into any server that uses Microsoft's Mail API (MAPI) drivers. You can sort through the headers of incoming mail, selectively download only those messages you care to read, send and receive multimedia messages (graphics, binary files, and faxes, for example), and time your connections, among other functions. There's even an X.400 gateway and built-in Internet access.

Scheduling is another matter. Microsoft's move into groupware is late. Whether Exchange will be informed by the early mistakes of Lotus Notes remains to be seen. With dial-up networking and e-mail built directly into Windows 95's operating system, however, Microsoft certainly makes life easy for mobile workers. But convenience isn't everything, and the other half of this equation requires Windows NT, which, for many of us, simply isn't an option.

FILEBOX

Windows 95 with Windows NT 3.5

Pros: Messaging for free.

Cons: Workgroup features are an unknown quantity.

Verdict: If you need only e-mail, look no further; scheduling is a gamble, though.

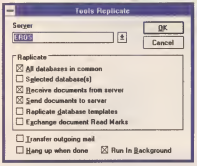
Windows 95, $95; **Windows NT 3.5,** $279 est. street price.
Microsoft Corp.
(800) 426-9400
Reader Service No. 815

LOTUS NOTES

Notable Groupware

Groupware: Lotus got there first. And of the three titans, it is still the only company to have delivered a full implementation of a groupware package. There's great peace of mind in working with a known quantity—just ask those who have traveled with Lotus Notes on their portable systems.

E-mail in Notes is straightforward. You can maintain multiple mailboxes and address books; search through message headers; view messages according to date, sender, category, size, and other criteria; attach any type of file you like to outgoing messages; and even design your own forms.



Scheduling and calendaring, on the other hand, have to be designed from the ground up. There is no scheduler per se. Nor is one planned for release 4.0, which should emerge sometime this year.

You have two ways to access Notes remotely: dial directly into the server to get your mail; or do your work offline, create a replica of the database, then dial in and update the database (thus updating your mailbox).

Lotus Notes' architecture is independent of any operating system, so there are no hidden costs in migrating to the package. With version 4.0, Lotus will add a communications server, which will include Simple Mail Transfer Protocol (Internet) and X.400 gateways as well as a long-awaited integration of Lotus's cc:Mail. Notes 4.0 will also support MAPI, so even if you choose to use Microsoft Mail on the road, you'll be able to dial into a Notes server.

Notes is an excellent choice if you work in a mixed environment. Its database might be overkill for straight e-mail; but for group collaboration, sales tracking, and other workgroup applications, there's nothing better.

FILEBOX

Notes

Pros: Well-tested, well-traveled, and operating system–independent.

Cons: No scheduler.

Verdict: If you don't mind using a third-party scheduler, Notes gives you e-mail and more.

$275 each for first 50 users
est. street price
Lotus Development Corp.
(800) 828-7688
Reader Service No. 816

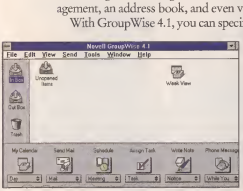
NOVELL GROUPWISE

Scheduling plus E-mail

Novell wisely chose to enter the e-mail fracas from the back door: Its strategy is to let you use any e-mail package you like on the client side. Novell simply wants control of your server.

Not that its own e-mail front end has just been lying around: The company claims to have more than 2.5 million registered GroupWise users (900,000 people use Lotus Notes). It's a feature-rich front end at that. Not only does it include e-mail, but it also has scheduling, calendaring, workflow, document management, an address book, and even voice mail.

With GroupWise 4.1, you can specify rules so that a message is automatically responded to or forwarded if the recipient is away. GroupWise supports multiple-message threading and multiuser response. It provides a rich array of message-handling features too, including the ability to retract sent messages and to file incoming messages into an unlimited number of folders.



Remote access requires you to set up a password-protected master mailbox on a host system, through which requests (send, forward, delete, and so on) are ushered.

So what does groupware have that GroupWise is missing? Whereas Lotus Notes excels at workflow, group-discussion, and project-tracking applications, Novell's GroupWise is still largely a point-to-point e-mail and scheduling package. You can't truly build custom applications on top of it.

No matter: For many traveling businesspeople GroupWise fills the remote-access bill. Given its extraordinary cross-compatibility, it has found a welcome audience with LAN managers.

FILEBOX

GroupWise

Pros: Deluxe mail-handling; cross-platform compatibility.

Cons: No workgroup apps.

Verdict: The easiest, most complete solution to e-mail and scheduling.

$695 (for five clients); $115 per license (20 to 49 licenses); $105 per license (50 to 99 licenses)
est. street price.
Novell Corp.
(800) 861-2507
Reader Service No. 817

Remote Control

So maybe you need a file on the hard drive of your desktop PC—not just access to the shared resources on the network. Give remote-control apps a chance. The top packages (for Windows 3.1) aren't perfect, but their performance and reliability have improved.

MICROCOM CARBON COPY 2.5 FOR WINDOWS

Best Usability

Hand it to Microcom's Carbon Copy for usability. It's easy to install and easy to put to work. The latest version features terminal emulation for connecting to outside information providers, as well as a gateway for gaining access to LAN-based PCs that aren't equipped with modems.

On the other hand, it's not the most feature-endowed program. Tops on our wish list for the upgrade are file-synchronization tools, file viewers, the ability to access the local desktop while connected remotely, and the ability to redirect print jobs.

FILEBOX

Carbon Copy 2.5 for Windows

Pros: Exquisite usability.

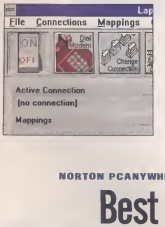
Cons: No file viewers.

Verdict: Quick and easy access.

$139 est. street price
Microcom
(800) 822-8224
Reader Service No. 818

TRAVELING SOFTWARE COMMWORKS 1.0A

Best Performance



Traveling Software's CommWorks is a bundle of well-crafted goodies—including LapLink Remote Access, which melds file synchronization with remote control. Unlike most remote-control software, LapLink Remote Access doesn't dog performance by shuttling every screen refresh and keystroke across the wire. Instead, you're limited to file management—including file transfers and synchronization—and printing on the host. You can't run a program remotely, but performance is fast. If you only need to grab, print, or update files on a remote system, CommWorks is the program to get.

FILEBOX

CommWorks

Pros: Fast file management from afar.

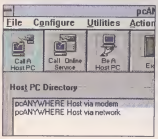
Cons: Can't run apps.

Verdict: It's fast, but best for basic file retrieval.

$149.95 est. street price
Traveling Software
(800) 343-8080
Reader Service No. 819

NORTON PCANYWHERE 2.0 FOR WINDOWS

Best Feature Set



Here's a cool trick: Reroute a print job from the host PC to the portable printer on your notebook. Here's another: Load that third-quarter spreadsheet on the host system remotely from your hotel room. Such features—along with excellent drive-mapping, e-mail, and file-synchronization tools—make pcAnywhere the fullest-featured remote-control package you can buy.

Unfortunately, the program's learning curve and usability could stand improvement. Still, if you use a remote-control package on a regular—and heavy—basis, you won't find anything better.

FILEBOX

pcAnywhere 2.0 for Windows

Pros: Powerful features.

Cons: Tough to master.

Verdict: Sophisticated, affordable remote control.

$130 est. street price
Symantec Corp.
(800) 441-7234
Reader Service No. 820

Dial-In Deliverables

Being out of the office doesn't have to mean being out of the loop. The fact that Microsoft built Remote Access Services into Windows 95 demonstrates the growing clout of mobile workers. Still, miracles rarely arise from software alone. Regardless of your specific needs for remote access, you'll need to find alternatives and cogitate your way around snags in connecting to the office—at least through the end of the decade. In mapping out your strategy, keep in mind several key issues.

What role will groupware play in your organization over the next five years? If everyone can live by phone, fax, e-mail, and scheduling, you can choose from a host of solutions, starting with Microsoft Mail, which comes built into Windows 95. Lotus Notes is a known quantity and is the best environment for developing custom workgroup apps, but Microsoft Exchange promises many features and an easy migration path. Not to be undercut by these programs, Novell's GroupWise falls short of true workgroup computing but provides e-mail, scheduling, workflow, and a multitude of other key remote applications that will certainly keep your information-systems department happy.

What's the best solution for remote-node access? That depends on the type of dial-in server your company uses. A Windows 95/Windows NT solution is the easiest way to connect, but it's not for everyone. Shiva's LANRover and Microcom's LANexpress face a long and happy future not only for NetWare houses, but also for the vast legacy of other servers. Besides, they provide an array of security and cost-saving features you can't get elsewhere.

What's the best solution for running an application on a remote desktop system? Remote-control software is hardly a great solution, but when you must run an app remotely, what's the alternative? Also, there are certain performance advantages, such as running a large database query remotely. If you haven't seen these packages lately, you'll be surprised at how far they've advanced.

DECISION MAKER — CHOOSE THE BEST **REMOTE-ACCESS** SOLUTION

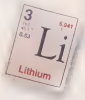
1 Choose the factor that's most important.	2 Choose the next most important factor.	3 What do you need to connect to?	4 For your needs, the best product to buy is . . .
E-mail	Scheduling	One PC	Windows 95
		Network	GroupWise
	File Access	One PC	pcAnywhere
		Network	Windows 95/NT
File Access	Application Access	One PC	pcAnywhere
		Network	Windows 95/NT
	E-mail	One PC	Windows 95
		Network	Windows 95/NT
Application Access	E-mail	One PC	Windows 95
		Network	Windows 95/NT
	File Access	One PC	pcAnywhere
		Network	Windows 95/NT

THE NEW ULTRAPORTABLE PORTÉGÉ™.

Toshiba engineers have done it again. Now you can get the incredible speed of a 90MHz Pentium™ processor in an ultraportable. The top-performing Portégé 610CT is packed with all the sophisticated features you'd expect in a full-size computer. A Lithium Ion battery provides up to five hours of use — without a recharge. Add to that, a spacious 720 Million Byte HDD, a large 9.5" diagonal color display, two stacked PC Card slots, a captivating sound system and an optional Port Replicator for one-step connection to your desktop. See how far Toshiba has taken every aspect of portable computing. And think where it can take you. **Call 1-800-457-7777 for your nearest dealer.**

PORTÉGÉ™ 610CT

Up to 5 Hours of Battery Life



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90MHz Pentium™ Processor

The Portégé legacy. *The Portégé Series has won prestigious awards including PC Computing's Product of the Year and Portable MVP and PC Magazine's award for Technical Excellence.*

PC Card expandability. *Two stacked PC Card slots (two Type II or one Type III) leave your options for storage, fax/modems, networking and the future wide open.*

PORTÉGÉ 610CT FEATURES:

- 90MHz Intel Pentium™ processor
- 9.5" dia. 24-bit color TFT active matrix display – 16.7 million colors
- 720 Million Bytes (=686MB) HDD
- 8MB RAM, upgradable to 40MB
- VL local-bus video
- Integrated 16-bit Sound Blaster™ compatible sound system
- New enhanced Lithium Ion battery
- Two stacked PC Card slots (two Type II or one Type III)
- AccuPoint™ integrated pointing device
- External 3.5" 1.44MB floppy drive
- 4.8 lbs. – 9.9" x 7.9" x 2.0"
- Optional Port Replicator
- DOS, Windows® for Workgroups, MaxTime® Power Management and Fn-ease™ software
- Toll-free technical support — 7 days a week/24 hours a day

In Touch with Tomorrow

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Toshiba. The World's Best Selling Portable Computers.

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Circle 214 on reader service card.

Crossroads

Windows 95 vs. OS/2:

BY ROBERT L. HUMMEL

Windows 95:

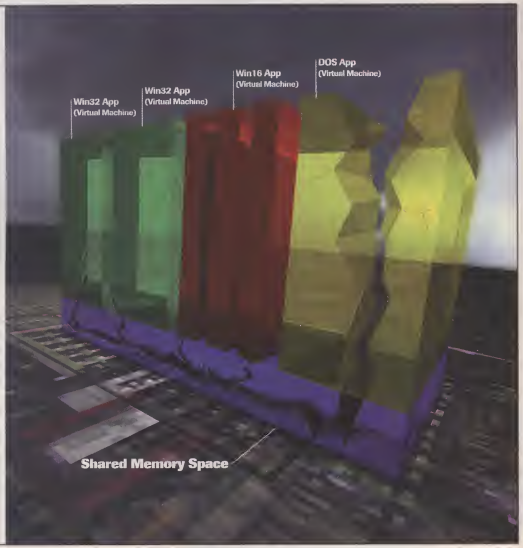
Microsoft's 32-bit operating system supports legacy hardware and software while keeping an eye on the future.

Pros

- Windows 3.1 apps will run under Windows 95 with no need for conversion.
- Windows 95 supports Plug and Play.

Cons

- The new interface may require some retraining for Windows 3.*x* users.
- Sharing memory between apps means system performance is sacrificed for the ability to use legacy devices. All apps also share memory space with the operating system—for example, a severe DOS app crash can bring down the whole system.



Verdict

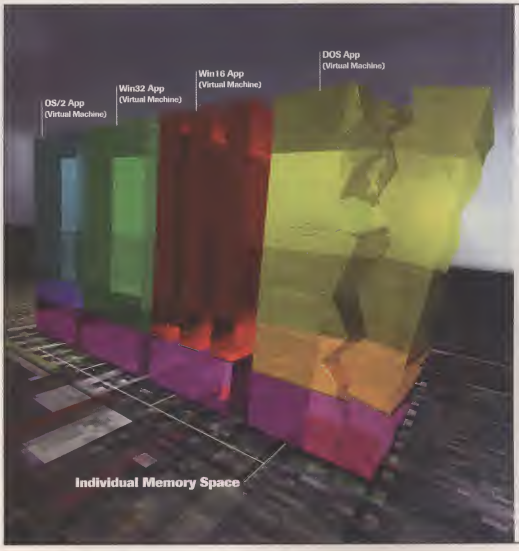
Windows 95 By a Mile: Despite OS/2's robust architecture and impressive multithreading capabilities, Windows 95 is likely to capture a significant share of the market over the next few years. New systems will ship with Windows 95 preloaded, and native Windows 95 applications will be released. Unless the software market changes dramatically, OS/2 will most likely be a perennial runner-up. OS/2's penetration of the market will continue to be hampered by a lack of horizontal applications, which goes to show that an operating system is only as good as the quality and volume of its native applications.

The Buzz

Windows Steamroller: Windows 3.1's huge installed base provides an eager market for an upgrade from this aging system. Windows 95 presents virtually no barriers to bringing along existing Windows applications. Most major software vendors have committed to releasing Windows 95 versions of their products. With fax, e-mail, and support for 32-bit apps, the lure is likely to prove irresistible. In our informal survey, 80 percent of industry observers indicated that Windows 95 was a "sure thing," while 20 percent felt strongly that OS/2 would eventually gain significant market share.

Broad-Based Applications or Better Crash Protection?

ILLUSTRATION BY TIMOTHY EDWARD DOWNS



OS/2: IBM's robust 32-bit operating system features impressive multithreading capabilities and crash protection.

Pros

- It runs OS/2, DOS, and Windows 16-bit and 32-bit (nonmultithreaded) applications from a single interface.
- Each application resides in individual memory space, minimizing the risk of a crash caused by a misbehaving application. This architecture provides superior crash protection.

Cons

- Few mainstream native OS/2 applications exist.
- Outdated hardware devices may be orphaned by lack of protected-mode device drivers.

Timetable

YEAR 96 EXPECTED

Around the Corner: Slipping ship dates and promotional hype have combined to build tremendous pent-up market demand for Windows 95. This will produce high out-the-door ship numbers during the first six months of the new product's life. Windows 95 will ship on all new systems, but it will coexist with older Windows 3.1 systems for a year or two as managers seek to capitalize on their investment in Windows 3.1 training. Some corporate users, burned before by embracing immature products, have indicated no desire to test another new operating system. Instead, they'll wait for the inevitable Windows 95.1 before switching.

Opinions

"Hands down, it's Windows 95! It was designed for a dual market: business and home. The home market is IBM's last frontier, at least till August; that's when the top hardware manufacturers will bundle Windows 95 with all systems.

JIM LISIAK
SYSTEMS SPECIALIST
CHEVRON INFORMATION TECHNOLOGY

Although OS/2 and the Mac OS are excellent, Microsoft has already won the battle. With Windows 3.1's installed base of over 120 million, it's only a matter of time before Windows 95 is fully integrated into the worldwide user base. A new generation of x86 processors works in its favor.

TIM BAJARIAN
PRESIDENT
CREATIVE STRATEGIES

Help: Working Smarter

The WordPerfect Name Game

I love WordPerfect. It's a consummate blend of power and ease of use. But perfect? Forget it. Even the best and brightest of WordPerfect's features leaves room for improvement. And that's what we're going to do with a WordPerfect 6.1 for Windows feature called descriptive filenames. It's an improvement over the DOS standard of 8 characters for a filename plus 3 characters for an extension. Descriptive filenames can be as long as 40 characters, and they can include spaces, punctuation, and both uppercase and lowercase letters. In other words, they're in English. You can give files names that make as much sense as 2nd Draft—First Quarter 95 Budget Report instead of 1Q95BUD.2ND.

Beyond 8-Dot-3 No other feature of WordPerfect can so completely transform the way you work. The only real downside of using descriptive filenames is that you'll be spoiled when you have to use other, less obliging DOS or Windows applications.

To get the most out of descriptive filenames, you must use them consistently. Here's how to make sure they become a habit: Select Edit, Preferences, Summary, and check the two boxes labeled "Use Descriptive Name" and "Create Summary on Save/Exit." It's also a good idea to look at the Summary dialog box at this point if you haven't already customized it. WordPerfect provides more than 50 fields—from Abstract to Version Number—that you can add and juggle to classify the summary information so it best meets your filing needs or work flow. To do so, select File, Document Summary. In the dialog box, click on Configure, then click on any field names on the right that you want to add to the list of desired options on the left. Click on a field name again to remove it. When you have a configuration you like, click on the Use As Default button.

Finally, click on File, Open. In the Open File dialog box, select Setup to open the Open/Save As Setup dialog box. Click on the Show drop-down list box and select Descriptive Name, Filename. (You can go back and experiment with Custom Columns later.) Then choose the Sort By drop-down list box and select Descriptive Name so that the list will be sorted alphabetically by the files' descriptive filenames whenever they're displayed in a File Save, Open, or Insert dialog box.

From now on, you'll be able to open a file by selecting it from a list of intelligent, easily understood descriptions.

Not Perfect If you retrieved an old letter with the descriptive filename Confirmation of Jones Deal, and you changed a few words so that the letter could serve as a confirmation of a similar Smith deal, you would, of course, save it under a new DOS filename. But in the File, Open dialog box, you'd see two files with the identical Confirmation of Jones Deal descriptive filename. Not very helpful, is it?

Another glitch: If you checked Original Document Backup when you set up your file-handling preferences, each time you save a file, WordPerfect copies the previously saved version to a file with the same name, but with the extension BK!. The idea is that if something goes terribly wrong, and even WordPerfect's hundreds of levels of Undo can't save you, you can call up the previous version of the file and take it from there. Good feature, but the descriptive filename for the BK! version is the same as for the original. Without the DOS filenames, you won't know which is the current version and which is the backup.

Because descriptive filenames are classified as "working-as-designed" program

BEFORE AND AFTER — AVOID REPEATING NAMES

Better Descriptions: Descriptive filenames are a much better idea than the old 8-dot-3 DOS method for naming files. But if you're not careful—and don't use our SAVE.WCM and SAVEAS.WCM macros—you can create more confusion than clarity.

Descriptive Name	Filename
I/O Tour	iotour.bk!
I/O Tour	iotour.dft
I/O Tour	iotour2.dft
I/O Tour	iotour3.dft
I/O Tour	iotourx.dft

What's What? Backup files share descriptive filenames with the originals, and with documents created by altering the original. You'll have to look at the DOS filenames to tell them apart.

Here's What: When you use our SAVE.WCM and SAVEAS.WCM macros, you're prompted to type new descriptive filenames, and backup files are tagged with |B| before the descriptive filename.

Descriptive Name	Filename
Approved versions -- I/O	iotourx.dft
I/O Tour	iotour.dft
Revised draft 2 -- I/O Tc	iotour3.dft
Second draft -- I/O Tour	iotour2.dft
|B| I/O Tour	iotour.bak

REMOVE-IT NEVER FORGETS TO TAKE OUT THE TRASH.

Oops. You let your guard down and now your hard disk is a mess. And the old applications, fonts, and files littering your PCs landscape are more than just unsightly—they can fill up your hard disk and sabotage system performance. Wouldn't it be great if someone could clean the garbage out of your computer, or even your entire network? A trusted friend who could do the job automatically, safely, and thoroughly?

Look no further: Remove-IT is the ultimate custodian for your computer.

IT'S A BROOM WITH A BRAIN

Don't feel guilty about having a messy hard drive—it's really not your fault. You see, every time you install a program, it hides bits and pieces all over your system. And here's the kicker: Even when you delete the application, piles of "secret" garbage are left behind.

But there's no trash heap that Remove-IT can't find. Its watchful Disk Custodian automatically alerts you to unused or unneeded programs. And Remove-IT has a unique Installation Knowledge Base—a virtual encyclopedia of more than 850 popular Windows™ and DOS applications.

LEAVES EVERY OTHER UNINSTALLER IN THE DUST.

	Remove-IT 2	UnInstaller™ 3
Smart Disk Custodian	✓	No
Cleanup Coach	✓	No
Installation Knowledge Base	✓	No
Windows 95 Upgrade Assistant	✓	No
Emergency Recovery Disk	✓	No
Automatic Installation Logging	✓	No

Together with the Log-IT feature, it remembers the location of everything you install to ensure safe and complete removal. Remove-IT even makes self-installing back-ups so you can easily transfer your programs to other PCs.

SAFE SANITATION

SAFE REMOVAL TECHNOLOGY

You never have to worry about damaging critical files and applications when you "clean house." Remove-IT's helpful Cleanup Coach expertly guides you through the removal process, while its Safe Removal Technology protects you from deleting the wrong files.

Remove-IT is more powerful and far more user-friendly than any competing program. It just works smarter—way smarter!

CLEAR THE PATH FOR WINDOWS™ 95

Remove-IT has a customized Upgrade Assistant that automatically prepares your PC for Windows™ 95 and reduces the chance of an upgrade problem. Then it cleans and configures your system after Windows 95 is installed. And even though Remove-IT is the most powerful cleaning machine you can buy, it won't clean out your pocketbook. We're now offering the latest version of Remove-IT—version 2.0—for just **$39.95**. Ask for Remove-IT at your favorite retailer, or call our handy toll-free number:

1-800-380-2607

Ask for extension **107**

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Circle 120 on reader service card.

EXPERT TIP DON'T SUMMARIZE THAT **TEMPLATE!**

Same but Different: When you create a template, make sure *not* to give it a descriptive filename. Here's why: Let's say you've set up WordPerfect to prompt you with the Summary dialog box whenever you save a file without a summary. When you save a template, WordPerfect will tempt you to fill in a Summary dialog with a descriptive filename. But if you fill in the Summary, then any file you create based on this template will inherit its summary. This could result in hundreds of documents with the same descriptive name.

The solution is to click on the Option button and choose Delete Summary from Document. You can give a template a descriptive filename that shows up in the New Document list of templates available to you. But no matter how similar to a regular document description this descriptive filename looks, it's a different animal.

features, they haven't had the attention that honest-to-goodness bugs receive. That gives you two choices.

The Windows Solution One choice is to wait for Windows 95, in which long filenames will be standard (except for non-Windows 95 applications, that is), along with many of the same useful file-handling tools found in WordPerfect's Open and Save boxes. With Windows 95 you'll have the filename capabilities DOS should have had a decade ago.

Another option is to use a couple of macros to solve the problems that crop up with descriptive filenames. The first macro—SAVEAS.WCM—keeps descriptive filenames from being carried over from an old document to a new document, as in the Smith and Jones letters. The macro contains only three lines:

```
Application (A1; "WordPerfect"; ↵
↳ Default; "US")
DocSummaryDlg ()
FileSaveAsDlg()
```

The first line is the typical macro heading gobbledygook. The second line opens the Document Summary dialog box, where you can type an updated descriptive filename to the new version of an old document. The last line opens the normal Save As dialog box so you can give the new version a legitimate DOS filename.

Next, replace the Save As selection on the File Menu with the macro. Put your pointer anywhere over the menus and click the right mouse-button. Choose Preferences to display the Toolbar Preference dialog box. If you haven't already created a custom menu, choose the Create button. Give your custom menu a name, and click on OK to edit it. First, you need to remove the old Save As so it won't conflict with the new one. It's very simple. Just drag it off the menu to delete it and click on OK to save the change. Next, click on Play a Macro, followed by Add Macro. From the list that appears, scroll down to SAVEAS.WCM and double-click. Save the macro's full path, and the macro's descriptive filename will appear on the top level of your main menu. To make it a total impostor for the old Save As selection, double-click on the new addition so you can edit the name to Save &As (the & symbol designates the following character as the underscored hotkey). If you want to use the standard F3 key for Save As, open the Keyboard Editor under Edit, Preferences and assign SAVEAS.WCM to that key.

Better Backup The other problem—the lack of any indication in the descriptive filename whether a file is the current or backup version—can also be solved with a macro, but it's too long to reprint here. SAVE.WCM can be downloaded from PC Contact's data library 6 (Tips & Macros) as WPMAX.ZIP (see page 280 for information). Here's what it does: First it turns off automatic backup of originals. Then it determines both the DOS and descriptive filenames for the active document: We'll call it *File A*. Then it opens a new file and inserts *File A*. The macro opens the Summary dialog box and replaces the descriptive filename with an exact duplicate of itself—except it's now preceded by the characters !BI. It saves the original file with the DOS filename for *File A*, changing the backup file's extension to BAK. (The usual WordPerfect for Windows backup extension, BK!, won't work. WordPerfect erases the BK! file when you run the macro.) So, in a file list, the old descriptive filename 2nd Draft—First Quarter 95 Budget Report now appears in the backup version as !BI 2nd draft—First Quarter 95 Budget Report. Finally, the macro saves *File A* normally, with its original descriptive filename and extension.

The two ! characters are used for two reasons: They set the B off from the wording of the descriptions, and the ! character has the benefit of being one of the few characters that isn't sorted alphabetically before A. If you sort a file listing by descriptive filename, the ! makes the backup files sink to the bottom of the list.

Use the method described above (customizing the menus for the SaveAs macro) to rename the original File, Save selection as something such as Old Sa&ve. Add a new &Save option to the File menu to play the Save macro. But don't change the Save key so that it also runs the macro, because executing the Save macro takes a second or two—not much time, but noticeably longer than the instantaneous action of the original save function. The screen actually goes blank at one point, but don't panic. It's normal. You can use the Save key for quick saves, and the menu Save once in a while to stay just this side of safe. In an imperfect world, it's sometimes better to have an imperfect solution. RON WHITE

WINGING IT WITH FONTS

Insymbol

Do you need to quickly paste a special character or accented vowel in your document? Insymbol is a small shareware program that lets you do that without copying characters to the Clipboard (the way you'd use the Windows applet, Character Map). Insymbol is available online from PC Contact in data library 0 (Windows Utilities) as INSYMB.ZIP. While you're at it, check out RONWCM.ZIP in data library 6 (Tips & Macros) for the macros discussed in this story. See page 280 for downloading information. You can also order Insymbol directly from its author, Glenn Alcot, 86-22 60th Road, Elmhurst, NY 11373.

The success of AutoCAD has inspired dozens of cheap imitations.

Unlike those "bargain" packages, AutoCAD® LT Release 2 is based on AutoCAD, the world standard, so it gives you features the others can't. In fact, its features and their ease of use have made AutoCAD LT the best selling 2D CAD package in the world. And now with Release 2, AutoCAD LT is even easier to use and learn, with tool-tips and on-line help at every level. If you're new to CAD from pencil-based drafting, *Orientation* can guide you step by step through the transition. To get you started quickly, AutoCAD LT automates the drawing setup process, defining drawing space and title blocks in one easy step. For occasional help with specific tasks, cue cards give you the on-screen answers you need without interrupting your work. And here's something else the others can't match. AutoCAD LT Release 2 reads and writes data just like AutoCAD software, so your work will be compatible with over a million AutoCAD users worldwide. Add to this free 90-day product support and available pre-drawn symbols packages for architectural, mechanical and electrical applications and you can see why you should beware of cheap imitations. So visit your local retailer or authorized AutoCAD dealer today and ask about our special offer for GenericCADD users. Or for a free demo disk, call 1-800-228-3601* and ask for Demopak A217.

And one inexpensive one.

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WINFAX PRO 4.0 AT WORK—AFTER HOURS

Fax Tips to Make You a Pro

Fax Time Is Money Your company makes the best use of its time with modern gadgetry. That's why you got a fax modem and WinFax Pro, right? But now you find that instead of wasting time waiting for your turn at the group fax machine, you still have to hold up other work on your desktop PC whenever you fax routine correspondence. And your faxes just don't seem to get noticed.

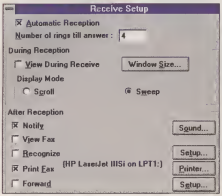
The 24-Hour Workday It's time to change some bad habits: Send your faxes after 5 p.m. and save time and money. You can dispatch that correspondence while you sleep—and leave the rest of your workload, meetings, and phone calls for 9 to 5. And why stop at simple faxes? Remember when you hired a temp to send out a survey with 2,000 respondents? Let the Faxmerge feature meld your database with your faxes: Just set the sending time and go home early.

The Real You Give your faxes the personal touch by customizing the templated cover page. Or set up the outgoing call dialog boxes with all the necessary prefixes to cover your remote and personal in-house calls.

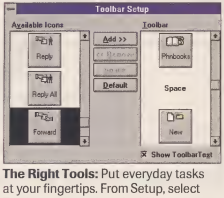
You can save time by cutting unnecessary steps in the daily process. Set it all up so that your faxes print as soon as they arrive, or so an alarm sounds when faxes come in. Or you can declutter the interface by eliminating unnecessary fields. Consider it interior design, housecleaning, and process reengineering—all with one app.

KYLA K. CARLSON

GUIDED TOUR CUSTOMIZING WINFAX PRO 4.0

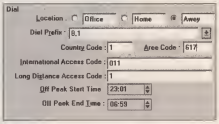


Incoming: Make sure you're receiving faxes the way you want to. Need to print them right away, or sound an alarm when they arrive? From Setup, choose Receive, and set your options.

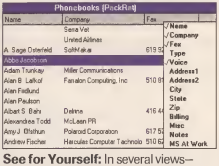


The Right Tools: Put everyday tasks at your fingertips. From Setup, select Toolbar, then click and add icons for common tasks. Gain screen real estate by unchecking Show Toolbar Text.

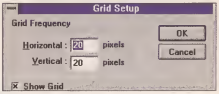
Designer Covers: Personalize your cover page by adding your company logo or using a special font. From Cover Page, select New, then click on Design. Click on File, New; then let your artistic side take over.



Where Am I? Whenever you travel, your area code and dialing prefixes are likely to change. Avoid the annoying busy tone you might get when autodialing an area code from within the same area code: Select Setup, User, and configure your most common travel destinations.



See for Yourself: In several views—such as Phonebooks and Outboxes—you can choose items to display. Right-click on the information bar and select the items you want to appear from the pop-up list. To adjust field widths, drag the divider lines between column headers.

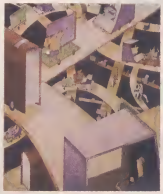


Stick to the Grid: When you're designing the perfect cover page, take a second to display grid lines so your objects line up just as you want them to. From the main menu, select Cover Page, New. Click on Design. Then select View, Grid Setup. Click on Show Grid, and determine the pixel spacing.

Network utilities—vital, but set aside 100K

DOS 6 utilities—handy, but about 120K

Multimedia—fun, but can you spare 50-80K?



Internet utilities—where will you get 120K?

If you don't have QEMM 7.5, what else have you sacrificed?

Sooner or later, as you push the limits of your PC's capabilities, you will run into a wall. Memory limits. Drivers that won't load. Crashes. "Out of Memory" messages. And you'll run into this wall whether you have one megabyte in your PC or 16.

That's why millions of people, from PC gurus to novice users run QEMM®. It fixes memory problems and keeps your PC performing at its best.

Introducing QEMM 7.5 It Makes Room for All the Good Stuff

Our newest QEMM takes into account the greater demands you're putting on 'conventional' memory today: device drivers, sound cards, disk compression, caches, network utilities, CD ROM drivers, etc. Not to mention all the stuff you want for tomorrow, like the drivers you'll need for Internet utilities. It finds room for all those things so you don't have to sacrifice capabilities you want—now or in the future.

MemMaker, the memory utility that comes with DOS 6, does an OK job of delivering additional memory, but it just hasn't kept up with demanding users.

Say you wanted to run a mouse, sound card, SmartDrive, your DOS 6 and Novell utilities, and your Microsoft Bookshelf '94 CD ROM. You couldn't with MemMaker. Not unless you were willing to manually 'tune' it. And then you might end up with 490K or so to use. But QEMM 7.5 routinely returns 634K of conventional memory. And when you consider as little as one 'K' of memory makes the difference between a program loading or not, you can see where an additional 140K or so could be vital.

A side benefit of running QEMM is that with memory 'elbow room' you get more reliability—fewer crashes and hangs. And some programs (especially games) run faster and smoother.

When you run DOS programs in Windows, QEMM 7.5 will provide benefits for those programs, too. Many productivity programs won't even run without it unless you sacrifice drivers and other goodies.

QEMM 7.5 comes with a new version of our award-winning memory utility, Manifest, which reports details you can't find out any other way—like how Windows and the programs running under it are using memory or what software is using your IRQs.

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There are dozens of new features and improvements to our new QEMM, making it even faster and safer. Find out for yourself. Visit your favorite software dealer or call (800) 571-4860 for a free brochure.

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- *QuickBoot* saves time
- *Optimize/Restore* lets you revert to recent settings

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Registered U.S. users of earlier versions of QEMM may purchase upgrades from dealers or direct from Quarterdeck for $29.95 plus $5 shipping & handling. Call (800) 354-4757.

Circle 187 on reader service card.

A POWERFUL BUT OVERLOOKED TOOL

Word Wizards Made (Relatively) Easy

We were desperate. We called Microsoft's tech-support line. No luck. We left messages on every forum of every online service we could find. Nobody answered. We called our buddies in Redmond—past, present, and future developers of Word for Windows itself, all gurus recognizable by their pizza-stained T-shirts—and nobody knew. Time to haul out the big guns. We hooked up a speakerphone and dialed the Psychic Network. *Bzzzz. Bzzzz. Click.* The clock started running at $4.99 a minute. "Hello. This is your personal psychic, Yolanda. Did you have a question?"

Vince, never reticent when greenbacks are flowing like water under the Matterhorn Bobsleds, said, "Yeah. At five bucks a minute, we need your insight. Do you know what a Wizard is? I mean, really?" "Oh, that's *easy*," she blurted out, quick as a wink. "A Wizard is anything Microsoft damn well says it is."

Hey, that's why *PC Computing* pays us the big bucks: sterling, in-depth technical research. The kind you won't find in any other magazine.

Take a look at some of Microsoft's Wizards. They all look and behave quite differently. It's almost as if the Windows people didn't talk to the Excel people, who didn't talk to the Word people. And forget about the NT group.

We were tempted to dismiss the Wizard phenomenon as yet another triumph of Microsoft marketing over bits-and-bytes reality. But after poking around awhile we came to the conclusion that doing so would be tantamount to throwing the baby out with the bathwater. There is a solid, important core of Wizard look and feel lurking here, screaming to get out. Or at least begging to be implemented consistently.

Something else was bugging us. In a typical month we see lots and lots of Word for Windows add-ins, yet we had rarely seen a genuine aftermarket Word for Windows Wizard. There are plenty of add-ins that do the kinds of things you would expect from a Wizard, but we have yet to see more than a few that look or behave like the 11 that ship with Word for Windows (Agenda, Award, Brochure, Calendar, Fax, Letter, Memo, Newsletter, Legal Pleading Paper, Resume, and Table). The method for constructing a Word for Windows Wizard is well documented on pages 202 to 211 in the first edition of the *Word Developer's Kit* (Microsoft Press, 1994). But it seems as if nobody outside Redmond is willing to create Wizards. Why?

We found out. Learning to write a Word for Windows Wizard is kind of like learning to ride a snowboard. In the middle of summer. With a three-ton spastic rhino strapped to your back.

This month we'll introduce you to the three-ton spastic rhino—otherwise known as the Word for Windows StartWizard template. Next month we'll show you how to put the template to work, using it to create a Wizard that produces trifold brochures.

The final product—source code and all—is available online from the PC Contact forum in data library 6 (Tips & Macros). Look for the file BROCH.ZIP. (See page 280 for information on logging on to PC Contact.) If you're curious about the three-ton rhino, open up the file BROCHURE.WIZ and (using Tools, Macro) take a look at the WizardSkeleton macro.

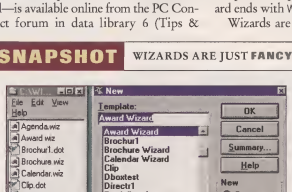
If you couldn't care less about this propeller-head stuff, just stick BROCHURE.WIZ in your \WINWORD\TEMPLATE subdirectory and click on File, then on New, and pick Brochure Wizard to create your own trifold brochures.

Oh. Lest you be tempted to use the official Make Wizard Wizard—Microsoft's attempt to automate the manufacturing of Word for Windows Wizards, embodied in the file MKWIZARD.WIZ—to create your own Wizard, be forewarned: You'll get a sequence of odd error messages: "Duplicate Label," "The wizard cannot continue because an internal error has occurred," and "Select without End Select." MKWIZARD.WIZ is available in the *Word Developer's Kit* and on the Microsoft Developer's Network CD-ROM. Once you get the hang of Wizards, that utility can be helpful. But the first time out, all those error messages are bound to scare ya!

Wizard Template What is a Wizard, you ask? In Word for Windows, a Wizard is just a template. Yep, a plain old DOT template, except the filename for a Wizard ends with WIZ instead of DOT.

Wizards are handled differently from

SNAPSHOT WIZARDS ARE JUST **FANCY TEMPLATES**



Presto Chango: The only visible differences between Wizards and templates are that Wizards get a WIZ extension in the filename (as opposed to DOT), and that FileNew adds Wizard to the filename in its dialog box list.

DOT templates in just one respect: When Word for Windows' FileNew hits a template that ends in WIZ, it adds the term Wizard to the end of the filename. So, for example, the template BROCHURE.DOT appears in FileNew's list as Brochure, whereas the template BROCHURE.WIZ appears as Brochure Wizard. That's the *entire* difference between a Wizard and a template. Well, almost. If you want to make Word for Windows Wizards that look like the ones that ship with Word for Windows, you'll have to jump through many hoops.

We've tried to minimize the initial pain by creating a Wizard Skeleton, which you can type in from "The Making of a Wizard," at right, or better yet, download from PC Contact. WizardSkeleton actually runs as a fully functional Wizard, but we'll wait until next month's installment to discuss the interesting stuff.

WizardSkeleton is similar to, and based on, a macro called StartWizard that Microsoft distributes with the *Word Developer's Kit* and the Developer's Network CD-ROM. Not ones to reinvent the wheel, we just took an axe to StartWizard, lopping off complex, rarely used parts, streamlining things the best we could. It makes more sense now.

Let's start by stepping through the more obscure lines in "The Making of a Wizard." We're going to assume that you know about dynamic dialog boxes; if you don't, grab a copy of the *Hacker's Guide to Word for Windows* (Addison-Wesley, 1994) and absorb pages 95 through 120.

After a garden-variety round of initialization, WizardSkeleton builds a dynamic dialog box. The first nine controls (numbered zero through eight) set up the standard Wizard dialog box, with three pictures (two of which just draw a line across the top), a couple of slots for text, and the Cancel, Back, Next, and Finish buttons.

Wizard at Work A Wizard works by painting specific things on top of a Wizard dialog box: A picture that helps the user visualize choices may go on the left, and text, buttons, and such on the right. The user progresses through dialog boxes by clicking on the Next button, or moves backward by clicking on Back. Microsoft calls these dialog boxes States—the dialog box starts out in State 1; when users click on Next, they end up in State 2, and so on.

Each State is defined in the code for the main dialog box. At the end of a State's definition, a call to the subroutine ItemsInState

SUPERSCRIPT THE MAKING OF A WIZARD

This is the front half of the Word for Windows StartWizard template. It's the skeleton of a four-pane Word for Windows Wizard. To create it, click on Tools, then Macro. Type in a name like WizardSkeleton, click on Create, and enter the following code. If you don't feel like typing, the whole template is available in PC Contact's data library 6 (Tips & Macros) in the file BROCH.ZIP (see page 280 for information).

```
' Portions Copyright © 1993 Microsoft Corp.

' Copyright © 1995 Pinecliffe International, Artemis Associates
' ========= Universal shared variables =========
Dim Shared CurState, LastState
Dim Shared StateItems(4)
  'Max of 4 states. Increase this if needed.
Dim Shared dlg As UserDialog
Dim Shared WizName$, WizINIFile$, PARA$, TTAB$, DQ$
' ========= Wizard-specific shared variables =========
' ========= InitGlobals ==========
Sub InitGlobals
  WizName$ = "Your Wizard Name" : WizINIFile$ = "YourWiz.INI"
  Print "Starting " + WizName$ + "..."
  PARA$ = Chr$(13) : TTAB$ = Chr$(9) : DQ$ = Chr$(34)
End Sub
' ========= StartWizard MAIN ==========
Sub MAIN
  InitGlobals
  Begin Dialog UserDialog 628, 276, WizName$, .DlgControl
  'General controls, 0-8
      'Use 2 lines to cover entire width
      Picture 0, 236, 500, 10, "LinePic", 1, .LinePicA          '0
      Picture 128, 236, 500, 10, "LinePic", 1, .LinePicB        '1
      Text 10, 250, 10, 13, **                                  'Dummy 2
      Text 10, 250, 10, 13, **                                  'Dummy 3
      CancelButton 313, 250, 80, 19, .Cancel                    '4
      PushButton 401, 250, 71, 19, "<&Back"                     '5
      PushButton 471, 250, 71, 19, "&Next>"                     '6
      PushButton 550, 250, 75, 19, "&Finish"                    '7
      Picture 16, 12, 250, 214, "YourWizPicture", 1, .StylePic  '8
      StateItems(0) = 9   'Number of general (state-independent) controls
'%% Wizard-specific states %%
'State 1
      Text 280, 20, 337, 13, "This is State 1 of 4", .st1
      ItemsInState 1
'State 2
      Text 280, 20, 337, 13, "This is State 2 of 4", .st2
      ItemsInState 1
'State 3
      Text 280, 30, 300, 26, "This is State 3 of 4", .st3
      ItemsInState 1
'State 4: Finish
      Picture 0, 0, 283, 226, "FlagPic", 1, .flag
      Text 280, 16, 335, 90, 'Those are all the answers the wizard needs to create ⊃
      ⊂your table!" + PARA$ + PARA$ + "Display Additional Info Here.'
      ItemsInState 2 'Number of items in state
  End Dialog
```

continued on page 196

SUPERSCRIPT MORE WIZARD MAKING

continued from page 195

```
  result = Dialog(dlg)
  If result = 0 Then Goto Bye
  WaitCursor 1
  'Additional cleanup/Work
  WaitCursor 0
Bye:
End Sub     ' MAIN
' ============ Required Custom Wizard Routines ==========
Sub DoWizard
'== Main Wizard Work Routine (response to Finish button)
End Sub
Function DoButtonClick(id$, item)
'Return 1 to end Wizard. Return 2 to override default behavior of std btns
  ret = 0
  If (item >= StateItems(0)) Then                    'Custom Button
  EndIf
  If (item < StateItems(0)) Then                     'Standard Button
  EndIf
  If Item = 7 Then            'Finish
      SaveDialog              'save settings
      DoWizard                'Perform Wizard Duties
      ret = 1                 'Exit Wizard
  EndIf
  DoButtonClick = ret
End Function'DoButtonClick
Sub ItemFocusChanged(id$, wold)
  cid = DlgControlId(id$)
End Sub
Function NextState(oldState)
  If oldState = LastState Then
      NextState = oldState                           'Safeguard
  Else
      NextState = oldState + 1
  EndIf
End Function'NextState
Function PrevState(oldState)
  If oldState = 1 Then
      PrevState = oldState
  Else
      PrevState = oldState - 1
  EndIf
End Function'PrevState
Sub ChangeState(new)
  SHControls(StateItems(CurState - 1), StateItems(CurState), 0)'hide old
  If new = LastState Or CurState = LastState Then DlgVisible 8'Toggle Picture
  SHControls(StateItems(new - 1), StateItems(new), 1)'show new
  CurState = new
  EnableControls
End Sub     'ChangeState
Sub SaveDialog
End Sub
Sub RstDialog
End Sub
```

keeps a running tally of how many controls are in each State. (Not your most standard coding practice. It's weird having subroutine calls in the middle of a dialog box, but we did warn you, didn't we?)

The DoWizard subroutine is the one that actually does the Wizard's work—it's the routine that's called when the user finally pushes the Finish button.

There are two other subroutines designed to make it easier to respond to user activity in the various states. DoButtonClick lets you write routines to respond to various button clicks. The variable item tells you which button was pushed. Typically, you'll be interested only in trapping custom buttons, the ones other than Cancel, Back, Next, and Finish. ItemFocusChanged lets you jump in if the user changes focus (for example, by using the Tab key, or clicking on a new control).

Next come two functions—NextState and PrevState—that update the number of the current State. They're called when the user clicks on Back or Next. The subroutine ChangeState blanks out all the controls in the old State, then paints all the controls in the new State. Finally, the subroutines SaveDialog and RstDialog give you a place to save and restore dialog settings, respectively. Ho-hum.

The second macro (also available on PC Contact) contains the part of the program you'll almost never change. DlgControl handles the stickier parts of the dynamic dialog box flim-flammery. ItemsInState keeps a simple stack of control counts. EnableControls takes care of graying out the Back and Next buttons at the beginning and end of the sequence of States. SHControls shows and hides controls. And all the Pref routines at the end provide simple wrappers for the Windows Private Profile String API calls.

Whew.

If you'd like to try your hand at writing a "real" Word for Windows Wizard, go ahead and get the skeleton running. Next month we'll show you how to turn this lifeless skeleton into something of a wand waver.

WOODY LEONHARD & VINCENT CHEN

WOODY *and* VINCE *plug the* Hacker's Guide to Word for Windows *so cavalierly because they and Scott Krueger wrote the book. Got a question? Drop the guys a line on PC Contact: Woody's at 72241,2125; Vince is at 72241,2221. Three-ton spastic rhino jokes encouraged.*

IF YOU THINK REMOTE COMPUTING IS A HASSLE, YOU'RE PROBABLY NOT ONE OF THE MILLIONS OF PEOPLE USING pcANYWHERE.

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PC MAGAZINE EDITORS' CHOICE

And why wouldn't they? To make sure you're always working with the most recent version of your document, our new file manager allows you to synchronize files and directories on remote and office PCs. And Norton pcANYWHERE doesn't require TSRs, freeing up memory for other important applications you may need. Moreover, pcANYWHERE doesn't replace any system .INI drivers, so you don't have to change your Windows environment just to use it. Norton pcANYWHERE is the only remote access software that offers this unique feature set combination. No wonder *InfoWorld* wrote, "If you're looking for a capability that's not in pcANYWHERE, it probably doesn't exist."

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OUR TECHNICAL EXPERTS RESPOND

Questions, Answers, and Tips

The Pentium scare may be old news by now, but for some unlucky users trouble may lurk just around the corner. And that's not all. Some viruses manage to fool even the most clever antivirus utilities, so you have to play hardball. We address these and other issues, and share tips and tricks that you can use in your favorite applications.

PENTIUM SOFTWARE PATCH

Question: *I understand that there's a software patch for correcting the problem with the buggy Pentium floating-point units (FPUs). Where can I find it?*

ARTURO GUZMAN
VIA COMPUSERVE

Answer: Our favorite is Eric Isaacson Software's FPUOFF.ZIP on ZiffNet's Executives Online forum (GO ZNT:EXEC), which turns off the floating point unit on the Pentium. Software fixes are fine, but consider them only temporary since turning off the FPU can slow overall system performance. Once you've implemented a software fix, we recommend calling your system vendor, or Intel at (800) 628-8686, to request a full replacement chip. **WT**

THE ALIEN VIRUS

Question: *I've discovered the AntiCMOS virus in my system. I ran a couple of antivirus utilities, and they weren't able to remove it. What's going on? Is my only recourse to reformat my hard disk?*

MANDY PAULSEN
VIA COMPUSERVE

Answer: The AntiCMOS virus infects the master boot record (MBR). The good news is, AntiCMOS makes a copy of the original, clean MBR and moves it to cylinder 0, head 0, sector 13.

The latest versions of McAfee's VirusScan and Symantec's Norton AntiVirus can repair this problem, but you can also do it yourself. If you have DOS 5.0 or later (and a clean boot disk), it's easy to recover from this problem. Make sure that the file FDISK.EXE is on the boot disk. If it's not, get a copy from a clean machine that has the same version of DOS. Boot with that disk, and at the A> prompt type FDISK/MBR. That's it. This will rebuild your MBR. Remove the boot disk and reboot as you normally would. Run the virus scan utility one more time to make sure that no traces are found, just in case. **YL**

PARADOX'S SUBSCRIPTS

Question: *Is it possible to use subscripts in Paradox 5.0? I'm a high school chemistry teacher and I need to input names of compounds into a database.*

DENNIS J. PLYLER
VIA THE INTERNET

Answer: The Paradox 5.0 for Windows database package can use any typeface that your other Windows applications can use. However, Paradox doesn't let you directly control fonts to the same degree that, say, your word processing package does. And you can't use superscript or subscript attributes in your database. But you can easily keep track of your chemical inventory in Paradox, using symbols, subscript, and even pictures of your chemical bonds. There are three ways to do it, two of which rely on Paradox's ability to use graphics.

Assuming that you have a field in your database for the English name of your chemical compound (such as caffeine), create a new field in your Paradox table called symbol, or any other descriptive name. Change this field's properties to Graphic. Then, in a graphics package such as Paintbrush, draw the symbol for the caffeine compound. As you enter data into your table, simply insert the graphic into the field. Whenever you query the data or create a report, Paradox will display the graphic alongside the compound's name.

The second way to keep track of your chemical compounds is to use OLE. Follow the same steps just described, but this time, change the field properties of your new field to OLE. When you're entering data, simply Insert the object—the chemical symbol you have drawn—into the field. OLE lets you use the same graphic in other applications. If

CONTACT GET IN THE QUEUE

Got a question, tip, or step-by-step solution? Send it to us right away! We pay $50 and up for tips and Step by Steps that we publish. No question is too simple or too difficult, so go ahead, challenge us. We publish tips on using undocumented features in any major app, and some minor ones as well. Our address is: Q&A, *PC Computing*, 950 Tower Lane, 19th Floor, Foster City, CA 94404. Better yet, use e-mail: CompuServe at 72241,1724; America Online at HelpPCC; or contact us via the Internet at yli-ron@pcc.ziff.com. Or send a fax to (415) 578-7029. Don't forget to include your address and a daytime phone number.

you need to change the graphic, you only need to change it once, and then update the rest of the applications.

The downside to the previous solutions is that you have to create a separate file for each chemical compound. While you get full control over how the compound is displayed, your hard drive will quickly become overrun by these files.

The simplest way to add a little pizzazz—and some subscript capabilities—to your database is to purchase a TrueType font set of chemical names and symbols. Famous Engineer Brand Software makes several TrueType and PostScript font sets that you can use to change the attributes of your chemical compound names. Contact them at (804) 739-5588 for information. You'll just need to change the font for your chemical names to one of the software-based fonts available. **JT**

CHANGING BOOT DRIVE

Question: *I have a 25MHz 486SX with an original 120MB Maxtor hard drive. I added a Fujitsu 528MB as a second hard drive. I made the new drive the slave drive, since it was easier to just add it to the end of the data cable, which was ready for the second hard drive. Both are IDE drives. The original hard drive is C: and I boot to it. Now I find I should have made the new hard drive my master drive so that I could boot to it instead of to the old C: drive. I have the new hard drive partitioned into D: and E: drives. Is there an easy way to move all my files, along with Windows 3.1, to the D: drive and make that one my boot drive? Can I use* **XCOPY** *to do this? I don't like the idea of going back in and changing jumpers because the new hard drive is underneath the power supply and it's hard to get to.*

JOE HOFFMAN
VIA COMPUSERVE

Answer: The Fujitsu drive is probably faster than the Maxtor drive, so switching is a good idea. But the only lasting solution is the one you dread: changing the jumpers on the drives to make your Fujitsu drive the master and the Maxtor drive the slave. However, preparing for the switch should be easy. First, make your D: drive a bootable system disk by formatting it with the /S option. Then use the command XCOPY C:*.* D:\ /S to copy all of your files over to the D: drive. Finally, do the mechanical work and switch the jumpers. When you reboot, your Fujitsu drive will be your boot drive with a disk environment that's identical to the original—and all the files on it will be defragmented, too. **WLR**

TYPING HEADACHES

Question: *I use Word 6.0 for Windows for most of my work. The problem is, I keep hitting my Caps Lock key. This means everything I type after my clumsy accidents needs to be retyped. I hate this key. I want to rip it off my keyboard but my boss won't let me. Is there a way to undo the all-caps text I've typed?*

PETER BRUNO
VIA COMPUSERVE

Answer: Select the mistyped text and press Shift-F3. This should fix the problem in most cases. If it doesn't, keep hitting Shift-F3; this cycles you through the initial-cap, all-cap, and all-lowercase styles. **EB**

OUTPUT QUICKEN'S TRENDS

Question: *I've always thought that one of Quicken for Windows' most powerful features is its ability to forecast my current income/expense trends into the future as a "financial*

STEP BY STEP PUBLISHER'S COLOR SEPARATIONS

No More Separations Anxiety:

Microsoft Publisher (2.0) can't generate film separations for color offset printing. But you can use the following workaround to produce two-color spot separations. This simple process takes advantage of Publisher's background page.

1. Mechanical Separation: As you build your document—like the advertisement shown at the right—place all of the spot-color elements (the headline and the star burst, for example) on the background page. All of the black elements, including text and rules, go on the foreground page. You can output the page as you normally would to a color printer to generate a composite proof. This is a good way to double-check the registration of elements within the design. Insert a second page into the document—and check the Duplicate All Objects On Page Number option.

2. No Background: To generate the black film, make sure that you are on Page 1, then open the Page menu and select Ignore Background. This effectively hides all of the color elements on the background page and prevents them from printing.

3. The "Blank" Page: Move to Page 2 of the document (the page you inserted). Select Page, Go To Background, and recolor all of the elements as black. This will avoid a feature of the Windows print engine that prints colors as shades of gray, and will instead force those elements to print as solids. Though the printout will be black and white, you can instruct a professional print shop to substitute a colored ink at press time.

LUISA SIMONE
AUTHOR OF *MICROSOFT PUBLISHER BY DESIGN*
(MICROSOFT PRESS, 1992)

planning graph." The actual data it uses to generate this graph is a collection of scheduled transactions and income/expense figures accessed via the forecasting module. How do I print this data?

JASON C. FRIX
VIA COMPUSERVE

Answer: There's no way to print this from Quicken, but you can use the Windows Clipboard. Here's how: In forecasting, click on the Expense box (lower-right corner). You are now looking at the Forecast Expense Items window. Here are the scheduled transactions and budgeted (expense) items that Quicken uses to construct the planning graph. Take note of the last transaction in the window. Press Alt-Print Scrn. This command copies the currently displayed portion of the active window to the Windows clipboard. Next, open PaintBrush and press Ctrl-V to paste. Print the image. Alt-Tab back to Quicken. Scroll down the list of transactions in the Forecast Expense Items window until you get to the last transaction (this way you can be sure not to miss any transactions). Repeat the copy-paste-print sequence until the entire window has been printed. In addition, try going into the Forecast Income Items window and print the items in that window. **PL**

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Question: *I'd like to "glance down and recognize a fax machine icon to tell me where my communications programs are located," as a reader requested in your March issue (Q&A, page 216), but I don't want to buy a third-party solution.*

STEPHEN COSTELLO
BOSTON, MASSACHUSETTS

Answer: You can nest groups within a group to achieve the next best thing. Imagine a minimized icon labeled Communications. When you double-click on it, you'll see a window containing icons for each of your communications programs.

How do you do this? The icon labeled Communications represents a Write document. In the Write document, you can have icons for each program, either by using drag-and-drop from File Manager or by using Object Packager. The drag-and-drop technique is easier, but it doesn't let you change the label under the icon. To use the Object Packager technique, first highlight the filename in File Manager and choose File, Copy, Copy to Clipboard, OK. Run Object Packager, and choose Edit, Paste. Then choose Edit, Label and type the label you want. Finally, choose Edit, Copy Package. In your Write document, choose Edit, Paste, and you're finished! **SB**

Compiled and edited by JAMES OLIVER CURY. *Technical assistance provided by* STEVE BASFORD, ED BOTT, PAUL LINDEMAN, YAEL LI-RON, WINN L. ROSCH, JOHN TASCHEK, *and* WENDY TAYLOR.

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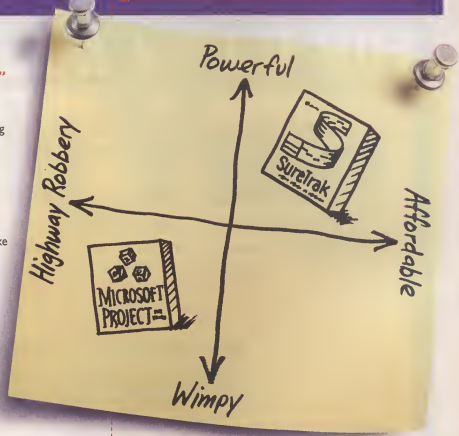

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The Right Stuff You're ready to invest in a new desktop system, but how do you decide which system is right for you? Technical Director Adam Meyerson describes three basic workplace scenarios and tells you what features, specifications, and configurations are most important for the kind of work you perform—and what's essential for every desktop system. 207

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MATCH SYSTEM SPECS TO YOUR NEEDS

Desktop Systems: Three Scenarios

If you're in the market for a desktop system, just remember this mantra: "Better, faster, cheaper . . . Better, faster, cheaper." But what's better? And what's faster? And when does cheap become just too, well, cheap? There's no simple answer to these questions. It all depends on what you're planning to do with your system. We've divided systems into three general categories for different kinds of users. The first is for those who manipulate complex graphics, like desktop publishers, CAD jockeys, and video swashbucklers. Next are speed-hungry number crunchers. Finally, there are the cost-conscious users whose apps require modest computational needs, such as light word processing and e-mail. Here's the breakdown.

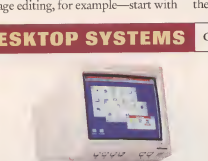
Better If you're manipulating heavy volumes of data or working with complex graphics—in CAD, 3-D rendering, or image editing, for example—start with a 90MHz or 100MHz Pentium and at least three PCI slots. Don't buy a Pentium without a PCI graphics accelerator. In addition, you'll want at least 32MB of RAM and 256K of level two or external cache. Upping the cache to 512K or 1MB will boost performance by 15 to 20 percent. Demand a 1GB EIDE hard drive, or a SCSI drive when opting for more than 1GB. New EIDE drives are as fast as or faster than SCSI drives, and they're cheaper because the controller is built into the system. That same controller will run new EIDE CD-ROM drives and tape backup drives. And don't settle for less than a quad-speed CD-ROM drive.

Faster For big spreadsheets, database work, or multimedia, you'll need at least a 75MHz Pentium, 16MB of RAM, and a 500MB EIDE hard drive. If you're on a budget, start with 8MB of RAM; it's easy to upgrade. Insist on PCI and 256K of cache.

Cheaper If your computing is limited to e-mail, word processing, or small spreadsheets, you can use a 66MHz 486. Choose a local bus—we recommend PCI over VESA—with 8MB of RAM and a 340MB hard drive. The 66MHz 486DX2 is the best value in this class.

Regardless of the system you choose, insist on an upgradable ZIF CPU socket, a plug-and-play flash BIOS, and at least four SIMM sockets. Don't forget plenty of available drive bays for expansion, so your next purchase can be an upgrade instead of a whole new machine. ADAM MEYERSON

DESKTOP SYSTEMS GET MORE RAM FOR FASTER PERFORMANCE



USABILITY

A. BIOS: Flash BIOS for easy upgrade.
B. Case: Tool-free cover removal.
C. CPU: ZIF CPU socket.
D. RAM: Easy access to SIMMs.
E. Hard Drive: Enhanced IDE.

FEATURES

1. **Cache:** 256K.
2. **RAM:** Expandable to 64MB.
3. **Monitor:** 17-inch.
4. **Monitor:** 21-inch.
5. **Video:** 64-bit VL-bus or PCI accelerator with 2MB of RAM.
6. **Video:** 64-bit VL-bus or PCI accelerator with 4MB of RAM.
7. **Hard Drive:** Enhanced IDE or SCSI-2.
8. **Sound:** 16-bit sound card (Sound Blaster compatible).
9. **CD-ROM:** Quad-speed Enhanced IDE or SCSI drive.
10. **Slots:** Three PCI or VL slots.
11. **Ports:** Two serial, one parallel, keyboard, mouse.

DECISION MAKER

1 What's more important?	2 Primary activity?	3 This is a minimum configuration	4 Look for these features . .
Text & Numbers	Word Processing & E-mail	66MHz 486DX2, 8MB of RAM, 340MB Hard Disk, 15-inch Monitor	**Usability:** A, B, C, D, E **Features:** 5, 7, 8, 9, 10, 11
	Spreadsheets & Databases	75MHz Pentium, 16MB of RAM, 500MB Hard Disk, 15-inch Monitor	**Usability:** A, B, C, D, E **Features:** 1, 2, 4, 6, 7, 8, 9, 10, 11
Graphics, Design & Multimedia	Drawings, Presentations, & Flowcharts	75MHz Pentium, 16MB of RAM, 500MB Hard Disk, CD-ROM Drive	**Usability:** A, B, C, D, E **Features:** 1, 2, 4, 6, 7, 8, 9, 10, 11
	CAD, 3-D Rendering, & Image Editing	90MHz or 100MHz Pentium, 32MB of RAM, 1GB Hard Disk, CD-ROM Drive	**Usability:** A, B, C, D, E **Features:** 1, 2, 4, 6, 7, 8, 9, 10, 11

MONITORS

SELECT THE **RIGHT SIZE** FOR YOUR APPLICATIONS

USABILITY

A. **Controls:** Front panel or onscreen digital.
B. **Power Management:** EPA Energy Star.
C. **Base:** Adjustable tilt and swivel.
D. **Input:** Multiple input sources.
E. **Settings:** Saved for different resolutions.

FEATURES

1. **Emissions:** MPR II.
2. **Tube:** Flat-square or Trinitron.
3. **Controls:** Microprocessor-based.
4. **Controls:** Color.
5. **Coating:** Antiglare.
6. **Vertical Refresh:** At least 72Hz.
7. **Vertical Refresh:** At least 76Hz.
8. **Vertical Refresh:** At least 84Hz.

DECISION MAKER

1 What's more important?	2 Primary activity?	3 This is a minimum configuration:	4 Look for these features . . .
Text & Numbers	Word Processing & E-mail	15-inch, 800-by-600-pixel Resolution, 0.28mm Dot Pitch	Usability: A, B, C, E Features: 1, 2, 3, 5, 6
	Spreadsheets & Databases	17-inch, 1,024-by-768-pixel Resolution, 0.28mm Dot Pitch	Usability: A, B, C, D, E Features: 1, 2, 3, 5, 6
Graphics, Design & Multimedia	Presentations & Drawing	21-inch, 1,280-by-1,024-pixel Resolution, 0.31mm Dot Pitch	Usability: A, B, C, D, E Features: [illegible]
	CAD & Page Layout	21-inch, 1,600-by-1,280-pixel Resolution, 0.31mm Dot Pitch	Usability: A, B, [illegible] E Features: [illegible]

GRAPHICS ACCELERATORS

GET YOURSELF A **LOCAL BUS** CARD

USABILITY

A. **Software:** For changing resolutions and colors.
B. **Software:** For driver installation.
C. **Extra:** Virtual desktop support.
D. **Jumpers and Switches:** None.

FEATURES

1. **Drivers:** Windows 3.1.
2. **Memory:** Expandable to 2MB.
3. **Memory:** Expandable to 4MB.
4. **Memory:** Expandable to 6MB.
5. **Vertical Refresh:** 72Hz or higher at all resolutions.
6. **Number of Colors:** 64,000.
7. **Number of Colors:** 16.7 million (true color).
8. **Feature Connector:** VESA advanced feature connector (VAFC) or VESA media channel (VMC) feature connector.
9. **3-D Support:** OpenGL or other 3-D formats.
10. **Resolution:** 1,600 by 1,200 pixels at 16.7 million colors.
11. **DRAM:** 2MB minimum.
12. **VRAM:** 4MB minimum.

DECISION MAKER

1 What's more important?	2 Primary activity?	3 This is a minimum configuration:	4 Look for these features . . .
Text & Numbers	Word Processing & E-mail	800-by-600-pixel Resolution at 256 Colors	Usability: A, B, D Features: 1, 2, 5
	Spreadsheets & Databases	1,024-by-768-pixel Resolution at 256 Colors	Usability: A, B, C, D Features: 1, 3, 5, 6, 11
Graphics	Design & Multimedia	1,024-by-768-pixel Resolution, 64-bit Accelerator	Usability: A, B, [illegible] Features: [illegible]
	CAD & Image Editing	1,280-by-1,024-pixel Resolution, 64-bit Accelerator	Usability: A, B, C, D Features: 1, 4, 5, 7, 8, 9, 10, 12

NETWORK SERVERS

DON'T COMPROMISE—GET A **PENTIUM**

USABILITY

A. BIDS: Flash for easy upgrades.
B. Enclosure: Tool-free removal.
C. CPU Socket: ZIF.
D. SIMMs: Easily accessible.
E. Drive Bays: Easily accessible.

FEATURES

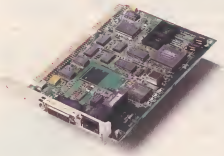
1. **CPU Cache:** Expandable to 1MB.
2. **Upgrade Potential:** Pentium upgradable.
3. **Interface:** Wide SCSI-2.
4. **RAID:** Level 3 or 5.
5. **RAM:** Expandable to 128MB.
6. **Bus Slots:** Eight EISA with two PCI.
7. **Internal Bays:** Two full-height 5.25-inch, two 3.5-inch.
8. **External Bays:** Two half-height 5.25-inch with front-panel access.
9. **Backup:** DAT.
10. **Network Card:** One 16-bit.
11. **Network Cards:** Two 16-bit.
12. **Protection:** UPS.

DECISION MAKER

1 How big is your network?	2 Primary activity?	3 This is a minimum configuration:	4 Look for these features . . .
20 or Fewer Clients	File Storage	66MHz 486DX2, 16MB of RAM, 1GB Hard Disk	**Usability:** A, B, C, D, E **Features:** 2, 5, 6, 7, 9, 11, 12
	Application Services	60MHz Pentium, 16MB of RAM, 1GB Hard Disk	**Usability:** A, B, C, D, E **Features:** 1, 3, 4, 5, 6, 7, 9, 10, 12
21 or More Clients	File Storage	60MHz Pentium, 32MB of RAM, 2GB Hard Disk	**Usability:** A, B, C, D, E **Features:** [illegible]
	Application Services	90MHz Pentium, 64MB of RAM, 4GB Hard Disk, RAID Level 5	**Usability:** A, B, C, D, E **Features:** [illegible]

ETHERNET CARDS

PICK THE ONE THAT SERVES YOUR **NETWORK NEEDS**



USABILITY

A. Software: Diagnostic utilities.
B. PROM: Flash upgradable.
C. Configuration: Through software (no jumpers or switches).
D. Virus Protection: Integrated PROM.
E. LEDs: Transmission and reception.

FEATURES

1. **Drivers:** NE2000-compatible.
2. **Network Management:** SNMP support.
3. **Bus Mastering:** Yes
4. **Extra:** Full-Duplex Ethernet support.
5. **Cache/Buffer:** 16K or larger.
6. **Bus Support:** PCI, VL, or EISA.
7. **OS Support:** NetWare, Windows NT, Windows for Workgroups, and OS/2.

DECISION MAKER

1 Where will you use it?	2 Primary activity?	3 This is a minimum configuration:	4 Look for these features . . .
Workstation	File Services	16-bit	**Usability:** A, B, C, D **Features:** 1, 2, 7
	Application Services	16-bit Bus Mastering	**Usability:** A, B, C, D **Features:** 1, 2, 5, 7
File Server	20 or Fewer Nodes	16-bit Bus Mastering	**Usability:** A, B, C, D **Features:** [illegible]
	21 or More Nodes	32-bit Bus Mastering	**Usability:** A, B, C, D **Features:** [illegible]

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3. Memory Products Available for Your System
4. The Most Cost Effective Upgrade Path for Your System
5. Your Systems Minimum and Maximum Memory Capabilities

First Source International takes the confusion out of your memory purchase.
Take advantage of our service and the savings!

PERSONAL COMPUTER MEMORY

AST

Premmia GX P/100, P/90						
8MB	501565-001	$309	16MB	501566 001	$609	
32MB	501567 001	$1 007	64MB	501568-001	$1,999	
Premmia MTE, SE P/60						
4MB	501159-001	$190	8MB	501159-002	$357	
16MB	501159-003	$712	32MB	501159-004	$1220	
Bravo 386-SX, WS/286 386						
2MB	500510-002	$88	4MB	500510-008	$195	
Bravo 3/25s						
2MB	500710-004	$89	8MB	500824-002	$304	
Advantage! Plus 486DX/33 DX2 50 DX2-66						
4MB	501168-001	$158	8MB	500824-001	$306	
Advantage! and Advantage! Pro 386SX/20, 25 Bravo 3/33s						
2MB	500962-001	$80	8MB	500962-002	$272	
Advantage! Pro 486DX/33 SX/25						
Bravo LC, LC II LP and MT						
2MB	500987-001	$86	4MB	500987-002	$151	
16MB	500987-004	$518	32MB	500987-005	$1089	
Premium 386/25 33 33T and Premium II 386SX/16, 20, 25						
1MB	500780-003 002				$45	
Premium 386/33T, 386SX/16 and Premium II 386SX/20, 25						
4MB	500780-004				$188	
Advantage! 486/25, 33, 33p SX20 Premium Server SE 4/33						
Power Premium and Premium TE all models						
Premium II 486/25 33 486/33, 486SX/20						
8MB	500780-001				$298	

DELL

Optiplex ME and V models PowerEdge XP models					
Performance L, M and T models					
4MB	310-3325	$151	16MB	310-3327	$525
Power Desktop and Low Profile Power Desktop models					
1MB	310 2505	$49	4MB	310-2507	$151
16MB	310-2625				$575
PowerLine Workstation DE and SE models					
2MB	310-2466	$99	4MB	310-2467	$190
8MB	310-2468	$357	16MB	310-2469	$712
Performance ME models					
8MB	310-3335	$305	32MB	310-3337	$1220

ZENITH

Z-400+ Z Station SEh, SEn, Sh, Sn DEh Dh and Xen					
Z-300/400 Series Z-420/SX, Z-425/SX, Z-433/DX, SX					
4MB	ME-100	$179	16MB	ME-90	$610

COMPAQ

Presario 500, 700 and 900 series					
4MB	147522-001	$159	8MB	147523-001	$307
16MB	147524-001	$544	32MB	147525-001	$1019
ProLiant 2000 and 4000 series, Systempro XL					
16MB	149949 001	$709	32MB	149912-001	$1426
64MB	149913-001	$2436	128M	149914-001	$4595
ProLinea 3/25s; 3/25zs					
2MB	141738-001	$89	8MB	141742-001	$304
Presario 600 and 800 series ProLinea 4/25, 4/33 4/50, 4/66					
ProLinea MT and ProLinea Enhanced series ProSignia VS					
4MB	141684-001				$153
8MB	141685-001				$307
DeskPro 386 20 25 386-20e, 25e					
1MB	113131-001	$62	4MB	113132-001	$167
DeskPro 386s/16					
4MB	112534-001				$194
4MB brd	113634-001				$287
DeskPro 3/25i 33i, 4/25iS, 33i, 66i, 286N, 386N SX/20 20N					
SystemPro LT and M Series					
4MB	118690-001				$153
8MB	118877-001				$356
ProSignia PC Server 486/33 DX2/66					
16MB	149320-001				$610
32MB	149147-001				$1152
DeskPro 386-33, 486-33, SystemPro and SystemPro E series					
2MB	115144-001				$109
8MB	116561-001				$376

STANDARD SIMMS — Easy UPGRADES

30-PIN	72-PIN
1 x 3-70ns (3-chip/1MB) $35.90	512 x 36-70ns (2MB) $92
1 x 9-70ns (1MB) $37	1 x 36-70ns (4MB) $140
4 x 9-70ns (4MB) $126	2 x 36-70ns (8MB) $294
16 x 9-70ns (16MB) $568	4 x 36-70ns (16MB) $548

First Source International Always Includes Installation Instructions! (on standard simms)

HEWLETT-PACKARD

Vectra VL2 XP, XU M2, N2 and XM2 models					
Netserver LM, LC and LF models					
4MB	D2974A	$179	8MB	D2975A	$356
16MB	D2297A	$609	32MB	D2298A	$1152
Vectra QS and RS models					
4MB	D1542 or 1642A.				$177
Vectra 486 M, M1 N, N1 and XM models					
2MB	D2381A	$95	8MB	D2152A	$305
4MB	D2156A	$151	16MB	D2676A	$611
Vectra 386/25, 486/25U, 33U 33ST, 50U 66U and 66ST					
2MB	D2381A	$95	8MB	D2152A	$357
Vectra 386/33N, N1 models					
2MB	D2714A	$92	8MB	D2715A	$304

NEC

Image 425, 433 466					
4MB	410-12002	$147	16MB	410-12003	$556
Ready 425, 433					
4MB	n/a.	$147	16MB	n/a.	$556
PowerMate 386/33i Express Te, e models					
4MB	OP410-6205	$176	16MB	OP410-6206	$610
PowerMate SX Plus					
2MB Board	n/a	$163	4MB Board	n/a.	$278
PowerMate SX/20					
2MB Upgrade	OP-410-8101				$151
2MB Board	OP-410-8102+B103				$171
PowerMate 386/20, 25					
2MB	APC-H655	$219	8MB	APC-H656	$559
PowerMate 386/33E 486/25E					
2MB	OP-410-5101				$171

IBM

Aptiva 300, 500 and 700 series					
4MB	n/a.	$159	16MB	n/a.	$509
Eduquest 55					
4MB	74G1299				$174
Eduquest 30 40 and 50 models					
4MB	60G0896	$174	16MB	60G0898	$549
PS/1 286 386SX					
2MB	92F9935	$83	4MB	92F9694	$163
Valuepoint Performance models					
4MB	92G9201	$179	8MB	92G7520	$354
PS/1 Consultant, Essential, Expert models x43, x44,					
PS/Valuepoint all models except Cxx models					
4MB	96F9290				$177
16MB	96F9291				$609
PS/1 Consultant, Essential, Expert models					
16MB	96F9291				$609
PS/2 25/286 30/286					
2MB	30F5360				$79
PS/2 35SX, LS, 40SX, 50Z, 55SX, LS, 65SX, LS, 70, XStation					
2MB	6450604				$87
PS/2 70-A21, A61, B21, B61 PS/Valuepoint Cxx models					
PS/1 Consultant, Essential, Expert models					
2MB	6450608				$95
PS/2 35SX, LS 40SX, 55SX, LS, 65SX, LS XStation					
PS/Valuepoint Cxx models					
4MB	34F2933 or 87F9977				$179
PS/2 35SX, LS, 40SX, PS/Valuepoint					
8MB	6450129				$356
PS/2 90 XP 95 XP, P75 (pairs) 56 57 (all) PS/1 Pro M2123					
2MB	6450902				$85
PS/2 90 XP 95 XP P75 (pairs) 56 57 (all models)					
PS/1 Consultant, Essential, Expert models, PS/1 Pro M2123					
4MB	6450128	$169	8MB	6450130	$356
PS/2 80-111, 311, 121, 321 081, 161					
2MB	6450379				$88
PS/2 80-A21, A31, A16					
4MB	6451060				$193
Expansion boards for PS/2 80286 based models					
4-16MB w/4MB	6450609 (use 72 pin)				$299
Expansion boards for PS/2 80386 based models					
2 14MB w/2MB	34F3077				$205
4-16MB w/4MB	34F3011				$299

LASER PRINTER MEMORY

Canon LBP-4					
1MB	n/a.	$109	2MB	n/a	$159
Canon LBP 8II, IIR, IIT					
2MB	S63 1880				$119
Epson ActionLaser 1000, 1500					
512K	n/a	$35	2MB	n/a	$99
Epson ActionLaser 1100					
2MB	n/a.	$105	4MB	n/a.	$159
Epson ActionLaser 1600					
4MB	n/a.	$159	16MB	n/a.	$609
HP LaserJet 4L					
1MB	C2024A				$48
HP LaserJet IIP, III IIIP, IIID					
2MB	33475B	$95	4MB	33477B	$169
HP LaserJet II IID					
2MB	33444B	$95	4MB	33445B	$169
HP LaserJet IIIsi, 4, 4M 4Si 4SIMX XI 300 Deskjet 1200c					
1MB	C2063A	$48	2MB	C2064A	$94
4MB	C2065A	$174	8MB	C2066A	$339
HP LaserJet 4P, 4MP, Color LaserJet					
2MB	C3131A	$95	4MB	C3132A	$179
HP DeskJet 500, 500C 520, 520C 550C, 560 560G					
256K	22707B				$40
IBM/Lexmark Laser 4019 (all models)					
2MB	1038675	$107	3 5MB	1039137	$167
IBM/Lexmark Laser 4029 (all models)					
2MB	1183334	$87	4MB	1183335	$157
IBM/Lexmark Laser 4039 4079 (all models)					
4MB	1328363	$157	8MB	1328365	$319
OkiLaser 400					
1MB	70014701	$69	2MB	n/a	$97
OkiLaser 400e, 410e					
2MB	n/a	$117	4MB	n/a.	$197
OkiLaser 830, 830 Plus, 840					
2MB	n/a.	$124	4MB	n/a.	$209
Panasonic LaserPartner 4400 5400					
2MB	KX-PEM1	$110	4MB	KX-PEM2	$204
Panasonic LaserPartner 4410, 4430					
2MB	KX P444	$115	4MB	n/a.	$196
Panasonic LaserPartner 4450i 4420					
2MB	KX-P441	$116	4MB	n/a.	$187
Texas Instruments MicroLaser, XL					
1MB	2555739-0001				$49

IBM ThinkPad 700 series 8MB Module $339

LAPTOP & NOTEBOOK MEMORY

AST

Ascentia 800n 810n	4MB	$185
	8MB	$359
	16MB	$609
Ascentia 900n, 910n	4MB	$205
	8MB	$359
	16MB	$609
Bravo NB 486	4MB	$169
	16MB	$599
PowerExec 4/25SL, Color, Plus	4MB	$185
	16MB	$629
PowerExec 3/25SL, 3/25SL-C EL	4MB	$149
	16MB	$629
Premium Exec 386SX/20, 25, 25C	4MB	$160

IBM

ThinkPad 220	4MB	$238
ThinkPad 230Cs	8MB	$409
ThinkPad 300	8MB	$339
ThinkPad 340 355, 360, 730	4MB	$168
	8MB	$309
	16MB	$651
ThinkPad 510	4MB	$199
	8MB	$359
ThinkPad 700, 720, 755 and CL57SX	4MB	$199
	8MB	$339
	16MB	$669
	32MB	$1399
ThinkPad 710T	4MB	$179
	8MB	$315
N51 Notebook	2MB	$95
	4MB	$179
L40SX, N33SX, PS/Note 182	4MB	$146
	8MB	$288

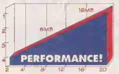
ZENITH

Z-Note 320L, Lh 325L Lc	2MB	$95
	8MB	$298
Z-Note 425 Series	4MB (3 3 V)	$155
	8MB (3 3 V)	$369
Z-Sport 420S, 425S	4MB	$189
Z-Sport 325S	4MB	$189
MastersPort 386SL, SLC, SLe	2MB	$85
MastersPort 386SX	2MB	$85
Z-Star	4MB	$159
	8MB	$369

TEXAS INSTRUMENTS

TravelMate 3000 (all models)	2MB	$79
TravelMate 4000 (all models)	4MB	$189
	16MB	$959
TravelMate 4000M, 5000	4MB	$398
	16MB	$799

WHY ADD MORE MEMORY?



Most applications run satisfactorily with 8MB, but in the long run 16MB is recommended

- ❐ Memory allows Windows & OS/2 to run faster
- ❐ Reduces your system's need to access the hard disk
- ❐ Utilize numerous & extensive applications at the same time

NEC

Versa S	4MB	$199
	8MB	$319
UltraLite Versa V, M, P	4MB	$189
	8MB	$349
	16MB (3 3 V)	$619
UltraLite III, SL/25C	2MB	$85
	6MB	$329
	8MB	$340
UltraLite SL/20, SL/20P	2MB	$85
	6MB	$279
ProSpeed 286, 386SX/16	4MB	$179

COMPAQ

Contura Aero 4/25, 4/33c	4MB	$179
	8MB	$299
Concerto 4/25, 4/33	4MB	$175
	8MB	$365
Contura 3/20, 3/25, 3/25c	4MB	$148
	8MB	$298
Contura 400 models	4MB	$180
	8MB	$365
	16MB	$651
Contura 4/25, 4/25cx, 4/25c	4MB	$169
	8MB	$298
	16MB	$635
LTE Elite	4MB	$174
	8MB	$315
	16MB	$598
LTE Lite 20 25 25c, 25c	4MB	$200
	8MB	$349
	16MB	$729
LTE Lite 4/25c	4MB	$180
	8MB	$339
	16MB	$659

TOSHIBA

T2000 2000SX, SXe	4MB	$167
T2200SX, T1800 Series	8MB	$317
T2400, T2450, 2100, 2150	4MB	$184
	8MB	$354
T1200XE, 1600, 3100E	2MB	$89
T3100SX, 3200SX, SXC	2MB	$115
	4MB	$147
T3300SL	4MB	$165
	8MB	$389
T3400, T3600	4MB	$185
	8MB	$348
T4400 T6400 (all models)	4MB	$179
	8MB	$339
	16MB	$675
T1900 T4500, T4600,	4MB (3 3 V)	$188
T4700 T4800 T4850,	8MB (3 3 V)	$349
T4900	16MB (3 3 V)	$719
T5400, T5200, T5200C, T8500	2MB	$87
	8MB	$347

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Memory Guaranteed - 100% Compatible in form, fit & function

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On all Paragon Memory products

EASY TO INSTALL
All products user installable, installation instructions included with most memory products

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Free technical support & direct dial lines for immediate response

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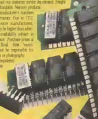

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1083MB	11ms	4090rpm	SCSI	3yr wty.	$399

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Save $10 on tape drive with hard drive purchase!
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CONNER	Int	Ext	COLORADO	Int	Ext
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1.7Gig	$340	$Call	1360MB	$349	$Call

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Price includes 1 FREE disk! Complete internal and external kits available for all computers.

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850MB	14ms	CFS850A	$249
1270MB	14ms	CFS1270A	$365
SCSI			
1080MB	11ms	CFP1080S	$469
2147MB	8.5ms	CFP2108S	$879
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1083MB	12ms	ST31220A	$340

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731MB	11ms	LT730A	$245
850MB	12ms	TB850A	$265
1050MB	12ms	FB1080A	$509
SCSI			
541MB	11ms	LT540S	$240
545MB	12ms	FB540S	$260
731MB	11ms	LT730S	$259
850MB	14ms	TB850S	$279
1050MB	12ms	FB1080S	$519
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NEC	CDR4X	4X	220ms $325
Plextor	PX43CS	4X	170ms $339
Sanyo	SH254S	4X	190ms $239
Sony	CDU55S	2X	250ms $159
Sanyo	SH93R	2X	280ms $149
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Sony	CDU50A	2X	250ms $119

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2Gig	Conner	CTD3800	$779 $879
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2-4Gig	Conner	CTD4000	$849 $949
2-4Gig	HP	35480	$869 $969
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1 EPP parallel port, 1 game port			$65 $85
DC280 16Bit IDE w/ High Speed IO			$55 $65
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DC600CF 16Bit Caching			$89 $79
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DC300B 16Bit Caching			$159 $139
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* The Triton PCI Chip Set, and the ATI MACH PCI Accelerator is only available on selected advertised Models. All Pentium systems come with 256KB cache, 486DX2/66 systems come with 128KB cache standard. Some software packaging may be cosmetically different than pictures shown. CD Titles do not include Manuals, CD Titles are subject to change and cannot be substituted. On-Site Service may not be available in certain remote areas. All returned items must have a Return Merchandise Authorization (RMA) number and must be in original packaging. The cost for returned freight is not included with any Money-Back Guarantees, shipping charges are non-refundable. Due to volatility of prices, Quantex does not offer a price protection policy. Prices and product descriptions subject to change without notice.Quantex Microsystems cannot be responsible for errors in typography or photography. "Intel486 and IntelDX2 are trademarks and Pentium and the Intel Inside Pentium processor are registered trademarks of Intel Corporation." Some of the names or trademarks shown herein may be the property of other companies. Screen images simulated. Quantex 1995 All Rights Reserved.

Mr. Boddy has been murdered, and his killer remains at large. But sometime today before the scheduled 8:00 p.m. reading of Mr. Boddy's last will and testament, the murderer will change the document to read in his or her favor.

Unfortunately Boddy's closest living relative, Mr. Green, is out of town on business and was not informed of his cousin's death. But those who have gathered at the Boddy mansion for the reading include Mrs. Peacock, his eccentric sister-in-law; Colonel Mustard, an old army buddy; Professor Plum, a dear friend and classmate during his days at Yale; Miss Scarlet, a "special friend"; and Mrs. White, his loyal servant of 25 years.

Please help us find the killer by determining who changed the will... where... and with what...

MIDWEST MICRO

The SoundBook II With Convenience Is Served
Lantrill Plus
File Settings Window Help
Mr. Boddy
Lantrill Plus
Control Machine
Display Plot
Exit
To my sister-in-law Mrs. Peacock, I leave, upon my death, funds to be donated to build an asylum in your name at the zoo. However, I am not granting you control of Boddy Savings and Loan, member FDIC.
PLUM
intel inside
Touch Pad
POINTING DEVICE

Personality Modules...

7:45 p.m. and tensions are high. The anticipated reading of the will is only minutes away. But with so many unique personalities in one room...MidWest Micro's SoundBook II should feel right at home!

When the main course is murder, people tend to lose their appetite—but they still hunger for convenience. And that's where the *NEW* SoundBook II comes in. Featuring a programmable Personal TouchPad, two RAM compartments and a modular design, this MidWest Micro Notebook is dressed to kill. So before we interrogate the other suspects at the table, let's investigate the SoundBook II...

Powerful Features...Weak Alibi

Who *knows* where this portable was on the night in question? Weighing only 6 lbs., it could have gone *anywhere*! Some eyewitnesses claim they saw the SoundBook II with a built-in floppy drive at 6:37 p.m. While another source swears the same drive bay was carrying an AC adapter at precisely 6:40! What makes the SoundBook II such a master of disguise?—It uses special compact peripherals, A.K.A. Personality Modules, that fit its modular 3.5" drive bay. Enjoy the floppy drive and AC adapter modules that come with your SoundBook II. And feel free to order additional modules like a 3.5" CD-ROM drive, a 14.4 Kbps voicemail fax modem, an extra hard drive and an extra battery.

Evidence Stacked In Your Favor

If *speed* is your motive, you may want to check out MidWest Micro's Pentium™ Processor Based SoundBook Plus. Like the SoundBook II, it comes with 16-bit stereo audio and built-in speakers. But this SoundBook *also* features a 75 MHz or 90 MHz Intel® Pentium Processor. And if you think *that* sounds like a setup, get a load of The Real Warranty. It covers all MidWest Micro Notebooks for a full three year sentence—parts *and* hard labor included! We can only assume that Mr. Boddy (being of sound mind) would have loved both MidWest Micro SoundBooks.

Contributing To The Delinquency Of A Diner?

Although it's unlikely that these MidWest Micro Notebooks are capable of murder, they *may* be found guilty of aiding and abetting. In fact, one of these guests may have already used a SoundBook to change Mr. Boddy's will... Perhaps Mrs. Peacock is doing it *right now*!—Or maybe she's just playing a little Microsoft® Golf.

Since we have a little time before Mr. Boddy's lawyer arrives, let's reconstruct another way this heinous crime may have been committed...

"Fastest portable we've ever tested, a fine desktop replacement"
— *PC World*, April 1995

"MidWest Micro wowed us with its Elite Pentium SoundBook Plus, the first Pentium-90 notebook we've tested; its performance blows every other reviewed mobile out of the water."
— *PC World*, March 1995

"...produced the highest Winstone 95 score of all reviewed systems"
— *PC Magazine*, January 1995

PC WORLD TOP 20 Mobile PCs

intel inside pentium

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Peripherals
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Colonel Mustard
UP TO 120 MHZ PENTIUM
intel inside
pentium
Mr. Boddy
ing officer, Colonel Mustard, I leave
all royalties from the Boddy Press
Military Book Club, and hope for
your continued silence about certain
events which happened long ago.
TOP SECR

In The Kitchen With A MidWest Micro PC?

"It's darn fast and darn cheap."
— *PC Computing*, April 1995

"The Elite P5-90 is one of the fastest computers we've tested."
— *PC World*, January 1995

PC WORLD TOP 20 Power Desktops

"I can't believe these people didn't put lunch on the itinerary," the Colonel grumbled. "And you would ***think*** *a person with this much money could afford better lunch meat." Was it merely hunger pains that brought Colonel Mustard into the kitchen this afternoon? Or was it Mr. Boddy's MidWest Micro Home PC… and revenge!…*

Mustard hadn't touched a computer since his code cracking days in the Middle East. But this "MidWest Micro Home PC" looked nothing like *that* relic. Typing in the secret password with his one good hand, the Colonel checked his watch again. He knew exactly how long it would take the IntelDX4™ 100 Processor to find the will, make the changes and save them on the Home PC's 850 Mb hard drive. "Not bloody long at all," he said with a smirk.

Colonel Mustard had planned his strategy very carefully. And after reading six computer magazines cover-to-cover, he learned that MidWest Micro Desktop Systems are available with Intel486™ and Pentium™ Processors, double- and quad-speed CD-ROM drives, voicemail fax modems and hard drive capacities up to 1.6 Gb! And whether you order a multimedia-packed Home PC or an Office PC stocked with powerful business software, you should always expect an ambush of high performance. But even nine weeks at boot camp, two wars and a Purple Heart didn't prepare the Colonel for what he was about to witness…

Opening the Home PC's Microsoft® Family Bundle, Mustard found an arsenal of interactive CD-ROM software—Encarta™ 95, Works, Money, Scenes, Dangerous Creatures and Golf were his to conquer. Before he knew it, the 15" color screen had exploded into multimedia mutiny. And he was even *more* impressed with Microsoft Bob™. Featuring eight household management programs in one efficient package, this new recruit had all the makings of a great soldier.

By this time the Colonel was distracted from his original covert operation. So he set a course for the library to see what Mr. Boddy's *120 MHz Office PC* had to offer…

Who killed Mr. Boddy and changed his will? The rest of the investigation is up to you…

To find out "who dun it" and receive a FREE catalog dial 1-800-204-0318.

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Caviar

ENHANCED IDE

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Peripherals
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AD#M07

MidWest Micro Home PCs

DX2-66 PCI $1699
#009401
- IntelDX2™ 66 Processor
- 8 Mb RAM, 128 Kb Cache
- 545 Mb IDE Hard Drive
- PCI Local Bus Graphics with 1 Mb
- PCI Fast IDE interface
- Quad-Speed CD-ROM Drive
- Microsoft Bob™
- Microsoft Family Bundle — Encarta ™ 95, Works, Money, Scenes, Dangerous Creatures & Golf
- Microsoft Complete Baseball CD
- 16-Bit Stereo Sound Card
- Digital Quality Speakers
- 14.4 Fax Modem with Voicemail
- 3.5" Disk Drive
- 14" SVGA .28 NI Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS® 6.22 and WFW 3.11
- EPA Energy Star Compliant
- The Real 3 Year Warranty

P5-75 PCI $2199
#009402
- Intel® 75 MHz Pentium™ Processor
- 8 Mb High Performance EDO RAM
- 850 Mb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 1 Mb
- Quad-Speed CD-ROM Drive
- Microsoft Bob
- Microsoft Family Bundle — Encarta 95, Works, Money, Scenes, Dangerous Creatures & Golf
- Microsoft Complete Baseball CD
- 16-Bit Wavetable Sound Card
- Altec Lansing® Stereo Speakers
- 14.4 Fax Modem with Voicemail
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- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- The Real 3 Year Warranty

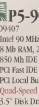
P5-100 PCI $3199
#008758
- Intel 100 MHz Pentium Processor
- 16 Mb RAM, 256 Kb Cache
- 1.2 Gb IDE Hard Drive
- PCI Fast IDE Interface
- ATI® MACH 64 PCI Accelerator with 2 Mb
- Quad-Speed CD-ROM Drive
- Microsoft Bob
- Microsoft Family Bundle — Encarta 95, Works, Money, Scenes, Dangerous Creatures & Golf
- Microsoft Complete Baseball CD
- 16-Bit Wavetable Sound Card
- Altec Lansing Stereo Speakers with Subwoofer
- 14.4 Fax Modem with Voicemail
- 3.5" Disk Drive
- 17" .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- The Real 3 Year Warranty

P5-120 PCI $3899
#008769
- Intel 120 MHz Pentium Processor
- 16 Mb RAM, 256 Kb Cache
- 1.6 Gb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Accelerator with 4 Mb VRAM
- Quad-Speed CD-ROM Drive
- Microsoft Bob
- Microsoft Family Bundle — Encarta 95, Works, Money, Scenes, Dangerous Creatures & Golf
- Microsoft Complete Baseball CD
- 16-Bit Wavetable Sound Card
- Altec Lansing Stereo Speakers with Subwoofer
- 14.4 Fax Modem with Voicemail
- 3.5" Disk Drive
- 17" .26 1600 x 1200 ExactMatch Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- The Real 3 Year Warranty

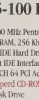
P5-90 PCI $2999
#008759

P5-120 PCI $3499
#008760

P5-100 PCI $3599
#008770



Dec 6, 1994
AT Graphics SPECISCION



MidWest Micro Office PCs

P5-75 PCI $2399
#009406
- Intel 75 MHz Pentium Processor
- 16 Mb High Performance EDO RAM
- 1 Gb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 1 Mb
- Quad-Speed CD-ROM Drive
- 3.5" Disk Drive
- 15" SVGA .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Word 6.0, Bookshelf, Encarta 95, Works Multimedia Edition 3.0 & Money 3.0
- The Real 3 Year Warranty

P5-90 PCI $2199
#009407
- Intel 90 MHz Pentium Processor
- 8 Mb RAM, 256 Kb Cache
- 850 Mb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 1 Mb
- Quad-Speed CD-ROM Drive
- 3.5" Disk Drive
- 15" SVGA .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS® Office Professional, Bookshelf & Encarta 95
- The Real 3 Year Warranty

P5-100 PCI $2899
#009409
- Intel 100 MHz Pentium Processor
- 16 Mb RAM, 256 Kb Cache
- 1.2 Gb IDE Hard Drive
- PCI Fast IDE Interface
- ATI MACH 64 PCI Accelerator with 2 Mb
- Quad-Speed CD-ROM Drive
- 3.5" Disk Drive
- 15" SVGA .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Office Professional, Bookshelf & Encarta 95
- The Real 3 Year Warranty

P5-120 PCI $4899
#008785
- Intel 120 MHz Pentium Processor
- 32 Mb RAM, 256 Kb Cache
- 1.6 Gb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Accelerator with 4 Mb VRAM
- Quad-Speed CD-ROM Drive
- 16-Bit Wavetable Sound Card
- Altec Lansing Stereo Speakers with Subwoofer
- 28.8 S/R Fax Modem
- 3.5" Disk Drive
- 17" .26 1600 x 1200 ExactMatch Color Monitor
- 10-Bay Full-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Microsoft Natural Keyboard
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- MS-DOS 6.22 and WFW 3.11
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P5-100 PCI $2399
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P5-90 PCI $2699
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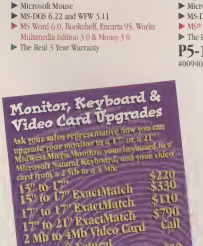
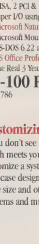


Customizing Your System

If you don't see a system configuration which meets your needs, we'll be glad to customize a system for you. Choose your own case design, amount of RAM, hard drive size and other add-ons such as modems and multimedia kits.



All Systems with a CD-ROM include TestDrive CD Software and Microsoft Home CD Sampler

MidWest Micro SoundBook Plus Based On Intel's Pentium™ Processor

- Intel® Pentium™ 90 or 75 MHz Processor
- 64-Bit, 256 KB Synchronous Burst External Cache
- 64-Bit, 8 Mb RAM (expands to 40 Mb)
- 10.3" Dual-Scan or 10.2" Active-Matrix VGA Display
- PCI Local Bus Video with 1 Mb VRAM
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- 16-Bit Stereo Audio (Sound Blaster & Windows™ Sound System Compatible)
- Built-in Stereo Speakers & Microphone
- External Jacks for Line In & Line Out
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- Weight: 6.8 lbs.
- Carrying Case
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intel inside pentium

Dual-Scan Color

P5-75 with 340 Mb HDD
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P5-90 with 520 Mb HDD & 16 Mb of RAM
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P5-90 with 720 Mb HDD, 16 Mb of RAM & PCMCIA 14.4 Fax Modem
#008102 **$4799**

P5-90 with 720 Mb HDD, 32 Mb of RAM & PCMCIA 14.4 Fax Modem
#008103 **$5499**

Options

8 Mb RAM Card	#002558	$379
16 Mb RAM Card	#002559	$779
MobileMax PCMCIA 130 Mb HDD	#004805	$229
MobileMax PCMCIA 170 Mb HDD	#004806	$345
PCMCIA 14.4 Fax Modem	#002624	$129
PCMCIA Combo Ethernet Adapter	#001954	$139
PCMCIA Panasonic Double-Speed CD-ROM Drive	#003728	$295
Leather Carrying Case	#001515	$ 99

MidWest Micro SoundBook II

- IntelDX4™ Processor with SMM Support
- Modular Design with Personality Modules
- 4 Mb RAM (expands to 36 Mb)
- 10.3" Dual-Scan or 10.2" Active-Matrix VGA Display
- Local Bus Video with 1 Mb
- 16 Bit Stereo Audio (Sound Blaster & Windows Sound System Compatible)
- 3.5" Floppy Disk Drive
- Two Type II/One Type III PCMCIA Slots
- Personal TouchPad Integrated Pointing Device
- NiMH Battery & AC Adapter
- Advanced Power Management
- One Parallel & One Serial Port
- External VGA & Keyboard Port
- MS-DOS 6.22 & WFW 3.11
- Microsoft Works for Windows 3.0 & Golf
- Lotus Organizer 2.0
- Weight: 6.0 lbs.
- Carrying Case
- The Real 3 Year Warranty

Dual-Scan Color

DX4-75 with 340 Mb HDD
#008141 **$1999**

DX4-75 with 520 Mb HDD & 8 Mb of RAM
#008106 **$2499**

DX4-100 with 520 Mb HDD & 8 Mb of RAM
#008142 **$2599**

DX4-100 with 720 Mb HDD & 8 Mb of RAM
#008108 **$2699**

DX4-100 with 720 Mb HDD, 16 Mb of RAM & PCMCIA 14.4 S/R Fax Modem
#008109 **$3199**

Active-Matrix Color

DX4-75 with 520 Mb HDD & 8 Mb of RAM
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DX4-100 with 520 Mb HDD & 16 Mb of RAM
#008112 **$3799**

DX4-100 with 720 Mb HDD, 16 Mb of RAM & PCMCIA 14.4 Fax Modem
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intel inside

Options

Personality Modules		
– AC Adapter	#004794	$ 79
– Battery	Call	Call
– 3.5" CD-ROM Drive	#004797	$429
– 14.4 Fax Modem with Voicemail	#004793	$145
4 Mb RAM Card	#006381	$199
8 Mb RAM Card	#002558	$379
16 Mb RAM Card	#002559	$779
128K Cache Upgrade	#004796	$ 69
Altec Lansing® ACS51 Speakers	#006712	$ 69
HP DeskJet 320 Printer	#004915	$309
MobileMax PCMCIA 130 Mb HDD	#004805	$229
MobileMax PCMCIA 170 Mb HDD	#004806	$345
PCMCIA 14.4 Fax Modem	#002624	$129
PCMCIA Combo Ethernet Adapter	#001954	$139
PCMCIA Panasonic Double-Speed CD-ROM Drive	#003728	$295
Leather Carrying Case	#001515	$ 99

* Ask your MidWest Micro sales representative about additional hard drive, screen and processor options.

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(In case we have a question about your order)

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Offer Source Code: 934. Offer expires 9/30/95. Offer valid to new members only.
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1. Mail in this card and in less than a week you will receive your software.

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TRY IT FREE!

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The ImagiNation map... what you'll see when you sign on.

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2. You bet I have at least a 2400 baud modem. You think I want to have all this fun by myself?

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PC Magazine Editors' Choice June 28, 1994

PC World Top 20, January 1994 February, April, May & June 1995

Thunderbolt P-90 W-SCSI

- Intel Pentium 90MHz CPU
- 16MB RAM, 256K Cache
- **2GB Wide-SCSI Hard Drive, 8ms**
- **New Diamond Stealth 64 Video w/2MB**
- PCI Wide-SCSI Controller
- 3.5" Floppy Drive, UART 16550 Fast IO
- **Toshiba 4X SCSI-II CD ROM Drive**
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- Mid-Tower Case
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Thunderbolt P-100M

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- **6X CD ROM Drive, 135ms, 900KB**
- **SoundBlaster AWE 32 Wavetable Stereo**
- **17" .26 Non-Interlaced Monitor**
- Desktop Case
- Enhanced 101 Keyboard/Mouse
- MS DOS 6.22 & WFW 3.11
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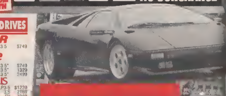

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PENTIUM-75		325
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PENTIUM-100*		375
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486DX2-66		145
486DX-100		145

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T2100

- Integrated Accupoint - small, accurate & easy to use
- Built-in AC adapter - small, sleek design & reduced weight
- 10.4" Dual Scan display

Processor	Screen	HD	Price
486DX2/50	9.5" Mono	250MB	$1419
486DX2/50	10.4" Dual Scan	330MB	2199
486DX2/50	8.4" Active	330MB	2699

Exciting New Notebooks from Toshiba!

- **Pentium!**
- **Multimedia!**
- **Built-in CD-ROM!**

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T4900

T4900CT

- 75MHz Pentium - for blazing performance
- 10.4" Active Matrix display
- Built-in 16-bit sound, microphone, speaker & MIDI

Processor	Screen	HD	Price
Pentium 75	10.4" Active	772MB	$5499

T2150

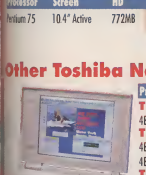
T2150

- Built-in CD-ROM Drive
- Built-in 16-bit sound, microphone, speaker & MIDI
- 10.4" Active & Dual Scan
- Built-in AC adapter - small, sleek design & reduced weight
- Integrated Accupoint - small, accurate & easy to use

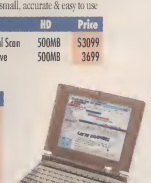
Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	500MB	$3099
486DX4/75	10.4" Active	500MB	3699

Other Toshiba Notebooks

Processor	Screen	HD	Price
T4800CT			
486DX4/75	9.5" Active	500MB	$3099
T4850CT			
486DX4/75	10.4" Active	500MB	$3199
486DX4/75	10.4" Active	772MB	3349
T3600			
486DX2/50	8.4" Active	500MB	$3239



T4800



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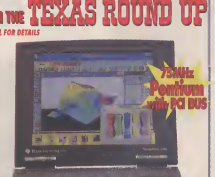

TravelMate 5000

TravelMate 5000

- 75MHz Pentium with PCI Bus to optimize Pentium processor performance
- 10.4" Active Matrix display with 2MB Video RAM
- 10.5" Dual Scan display with 2MB Video RAM
- 65K colors on notebook display
- 16-bit Sound Card, Speaker, Microphone & MIDI
- Upgradable hard drive - easily add more storage
- Built-In Dual Lithium Ion Batteries
- Built-in infrared for no hassle printer connections

Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	500MB	$4999
Pentium 75	10.4" Active	772MB	5599

TravelMate 4000M

- Brilliant color display
- 16-bit sound card
- Integrated pointing device
- 2 Type II or 1 Type III PCMCIA slot

Processor	Screen	HD	Price
486DX2/50	9.5" Dual Scan	340MB	$2119
486DX2/50	8.4" Active	455MB	2379
486DX4/75	9.5" Dual Scan	455MB	2459
486DX4/75	8.4" Active	340MB	2729
486DX4/75	8.4" Active	455MB	2979
486DX4/100	9.5" Active	525MB	3939

TM4000M CD-ROM Docking Station: $809.99

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Processor	Screen	HD	Price
Ascentia 950N New!			
Pentium 75	10.4" Dual Scan	500MB	$3439
Pentium 75	10.4" Dual Scan	800MB	3739
Pentium 75	10.4" Dual Scan	1.2GB	4229
Pentium 75	10.4" Active	800MB	4899
Pentium 75	10.4" Active	1.2GB	5399
Ascentia 810N			
486DX2/66	10.4" Dual Scan	250MB	$1969
486DX2/66	10.4" Dual Scan	340MB	2119
486DX2/66	10.4" Dual Scan	510MB	2259
Advantage Adventure Multimedia (4X CD-ROM)			
All-N-One (4000)	486DX2/66	540MB	$1699
Desktop (6000)	486DX2/66	540MB	1299
Desktop (6000)	486DX2/66	540MB	1599
Desktop (6000)	Pentium 75	540MB	1999
Minitower (8000)	Pentium 75	1GB	2299
Minitower (8000)	Pentium 90	1GB	2599
Minitower (8000)	Pentium 100	1GB	2799

Monitors Priced Separately

Ascentia 910N

Ascentia 910N

- 10.4" Active & 10.5" Dual Scan
- Lithium Ion battery technology
- Intelligent power management to maximize performance
- Integrated Smartpoint - small, accurate & easy to use

Processor	Screen	HD	Price
486DX2/50	10.3" Dual Scan	340MB	$2559
486DX4/75	10.3" Dual Scan	510MB	2749
486DX4/75	10.3" Dual Scan	700MB	3049
486DX4/75	10.4" Active	510MB	3829
486DX4/75	10.4" Active	700MB	4129

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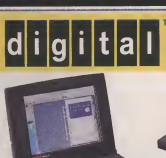

HiNote

HiNote Ultra

HiNote

- All models 5.5 lbs. or less - **ONLY 1.6" thick**
- Upgradable hard drive - easily add more storage
- Built-in front mounted trackball - easy to use for right- & left-handed users
- 3-year warranty - **FREE** 1-year Passport Service

Processor	Screen	HD	Price
486SX/33	9.5" Mono	170MB	$1379
486SX/33	9.5" Dual Scan	240MB	1879
486DX2/50	9.5" Dual Scan	340MB	1929
486DX2/50	9.5" Active	240MB	3029
486DX4/75	9.5" Active	340MB	3339
486DX4/75	9.5" Active	510MB	CALL

HiNote Ultra

- All models 4 lbs. or less - **ONLY 1.1" thick**
- Built-in sound, microphone & speaker
- Lithium Ion battery technology
- Built-in infrared
- 3-year warranty - **FREE** 1-year Passport Service

Processor	Screen	HD	Price
486SX/33	9.5" Mono	170MB	$1919
486DX2/50	9.5" Dual Scan	340MB	318
486DX2/50	9.5" Active	340MB	430
486DX4/75	9.5" Active	340MB	469

COMPAQ

Contura 410

LTE Elite

Contura 410

- Upgradable hard drive - easily add more storage
- 32-bit local bus with 1MB video RAM
- Extended life NiMH battery technology
- Compaq, 3-year worldwide warranty

Processor	Screen	HD	Price
486DX2/50	9.5" Dual Scan	350MB	$2369
486DX2/50	8.4" Active	350MB	2839

LTE Elite

- 10.4" Active Matrix display
- Fast 486DX4/75 processor
- Built-in AC adapter - small, sleek design & reduced weight
- Upgradable hard drive - easily add more storage

Processor	Screen	HD	Price
486DX4/75	9.5" Dual Scan	340MB	$3129
486DX4/75	9.5" Dual Scan	510MB	3499
486DX4/75	10.4" Active	510MB	5029
486DX4/75	10.4" Active	810MB	5389

IBM®

ThinkPad® 755CD

ThinkPad® 755

Pentiums Now Available!

- Built-in CD-ROM Drive (755CD models only)
- Built-in 16-bit sound, microphone, speaker (MIDI) on 755CD models)
- 10.4" Active (65K colors) & 10.4" Dual Scan
- 14.4 fax/modem, speaker phone, answering machine & voice mail
- Built-in infrared

Processor	Screen	HD	Price
486DX4/100	10.4" Dual Scan	340MB	$4699
486DX4/100	10.4" Dual Scan	540MB	4649
486DX4/100	10.4" Dual Scan	810MB	4899
486DX4/100	10.4" Active	340MB	4899
486DX4/100	10.4" Active	540MB	5349
486DX4/100	10.4" Active	810MB	5749
486DX4/100	10.4" Active	540MB	6249*
486DX4/100	10.4" Active	810MB	6799*
Pentium 75	10.4" Active	540MB	6549
Pentium 75	10.4" Active	810MB	6999

*Features Built-In CD-ROM drive

More IBM® Notebooks

Processor	Screen	HD	Price
IBM ThinkPad® 360 & 360E			
486SL/33	8.4" Active	340MB	$1999
486DX2/50	8.4" Active	340MB	3099
486DX2/50	8.4" Active	540MB	3449

Processor	Screen	HD	Price
IBM ThinkPad® 701			
486DX2/50	10.4" Active	360MB	$4799
486DX2/50	10.4" Active	540MB	5149
486DX4/75	10.4" Dual Scan	360MB	4599
486DX4/75	10.4" Dual Scan	540MB	4749
486DX4/75	10.4" Active	360MB	5299
486DX4/75	10.4" Active	540MB	5649

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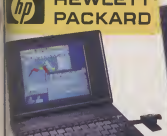

NEW MODELS!

HP OmniBook 600 Notebook PC

HP OmniBook 4000 Notebook PC

HP OmniBook 600

- Weighs as little as 3.8 lbs.
- Upgradable PCMCIA hard drive - easily add more storage
- Built-in infrared for no hassle printer connections
- Instant "ON" resume feature - lasts up to 1 week

Processor	Screen	HD	Price
486DX2/50	8.5" Dual Scan	170MB	$2419
486DX2/50	8.5" Dual Scan	260MB	2549
486DX4/75	8.5" Dual Scan	170MB	2869
486DX4/75	8.5" Dual Scan	260MB	3049

HP OmniBook 4000

- 10.4" Active & 10.3" Dual Scan
- Built-in 16-bit sound, microphone & speaker
- Replace floppy w/ 2nd battery for 5-7 hrs. battery life
- Built-In infrared for no hassle printer connections

Processor	Screen	HD	Price
486DX4/75	10.4" Active	340MB	$3639
486DX4/75	10.4" Active	520MB	3879
486DX4/75	10.4" Active	810MB	4219
486DX4/100	10.3" Dual Scan	340MB	3259
486DX4/100	10.3" Dual Scan	520MB	3549
486DX4/100	10.3" Dual Scan	810MB	3889
486DX4/100	10.4" Active	340MB	3819
486DX4/100	10.4" Active	520MB	4099
486DX4/100	10.4" Active	810MB	4439
486DX4/100	10.4" Active	810MB	5099*

* 16MB RAM standard

HP DeskJet 320 Printer

$299.99

Shown with optional feeder and color kit

NEW! HP LaserJet Printers

HP LaserJet 5P printer (IBM, 6ppm, 600dpi)	$879.99
HP LaserJet 5MP printer (IBM&MAC, 6ppm, 600dpi)	1039.99

HP LaserJet Printers

HP LaserJet 4L printer (IBM, 4ppm, 300dpi)	$499.99

InkJet Printers

HP DeskJet 320 printer (portable)	$299.99
HP DeskJet 320 printer w/Feeder	359.99
HP DeskWriter 320 printer (portable)	299.99
HP DeskWriter 320 printer w/feeder	359.99
HP DeskJet 540 printer	289.99
HP DeskWriter 540 printer	289.99
HP DeskJet 660C printer	479.99
HP DeskWriter 660K printer	479.99
HP DeskJet 1200C printer	979.99
HP DeskWriter 1200C/PS printer	1589.99
HP OfficeJet	689.99
HP FAX-700	549.99

HP Scanners

HP ScanJet 3P (grayscale)	$319.99
HP ScanJet 3C (color)	949.99

HP (Colorado) Tape Drives

Colorado 350MB (portable)	$269.99
Colorado 700MB (portable)	339.99
Colorado 350MB (internal)	139.99
Colorado 700MB (internal)	269.99
Colorado 1400, 1.36GB (internal)	369.99
Colorado 1800, 1.80GB (internal)	199.99

HP DeskJet 5P 600dpi

$879.99

NEC

Versa M

Versa P

Versa M

- High Res. displays available - 800x600 res. on notebook
- True color displays available - 16.7 million colors on notebook
- Removable/Reversible display
- Replace floppy w/ 2nd battery for 6-10 hrs. battery life
- Replace floppy w/ Versa Bay - Add extra PCMCIA
- Built-in 16-bit sound, microphone & speaker
- Upgradable hard drive - easily add more storage

Processor	Screen	HD	Price
486DX4/75	9.5" Dual Scan	250MB	$2649
486DX4/75	9.5" Dual Scan	340MB	2739
486DX4/75	9.5" Active	340MB	3169
486DX4/75	9.5" Active	540MB	3449
486DX4/75	9.5" True Color	340MB	3449
486DX4/75	9.5" High Res.	540MB	3829
486DX4/100	9.5" Active	340MB	3639
486DX4/100	9.5" True Color	540MB	4199
486DX4/100	9.5" Active	810MB	4299
486DX4/100	9.5" High Res.	540MB	4299
486DX4/100	9.5" High Res.	810MB	4679

Versa P

- 75MHz Pentium - for blazing performance
- High Res. displays available - 800x600 res. on notebook (10.4" on selected models)
- Removable/Reversible display
- Replace floppy w/ 2nd battery for 6-10 hrs. battery life
- Replace floppy w/ Versa Bay - Add extra PCMCIA
- Built-in 16-bit sound, microphone & speaker
- Upgradable hard drive - easily add more storage

Processor	Screen	HD	Price
Pentium 75	9.5" Active	340MB	$4349
Pentium 75	9.5" Active	540MB	4629
Pentium 75	9.5" Active	810MB	4999
Pentium 75	9.5" High Res.	540MB	4999
Pentium 75	9.5" High Res.	810MB	5389
Pentium 75	10.4" Active	540MB	4999
Pentium 75	10.4" Active	810MB	5389
Pentium 75	10.4" High Res.	810MB	5769

Versa V *New Models!*

- Replace floppy w/ 2nd battery for 6-10 hrs. battery life
- Upgradable hard drive - easily add more storage
- 32-bit local bus with 1MB video RAM
- 64k colors on notebook display (Active only)

Processor	Screen	HD	Price
486DX2/50	9.5" Dual Scan	250MB	$2219
486DX2/50	9.5" Dual Scan	340MB	2359
486DX2/50	9.5" Active	250MB	2359
486DX2/50	9.5" Active	340MB	2599
486DX2/50	9.5" Active	540MB	2879
486DX4/75	9.5" Active	340MB	2789
486DX4/75	9.5" Active	540MB	3069
486DX2/50	10.1" Active	340MB	2839
486DX4/75	10.1" Active	540MB	3279

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- Quad Speed CD-ROM drive
- 16-bit SoundBlaster compatible sound card
- PCI local bus - high-speed graphics
- 14.4 fax/modem, speaker phone, answering machine
- LOADS of FREE software

Chassis	Processor	HD	Price
Minitower	486DX4/100	540MB	$1699
Minitower	Pentium 75	850MB	1999
Minitower	Pentium 90	850MB	2299
Minitower	Pentium 90	1.2GB	2699
Minitower	Pentium 100	1.2GB	2999

Monitors priced separately.

PCC 7/95

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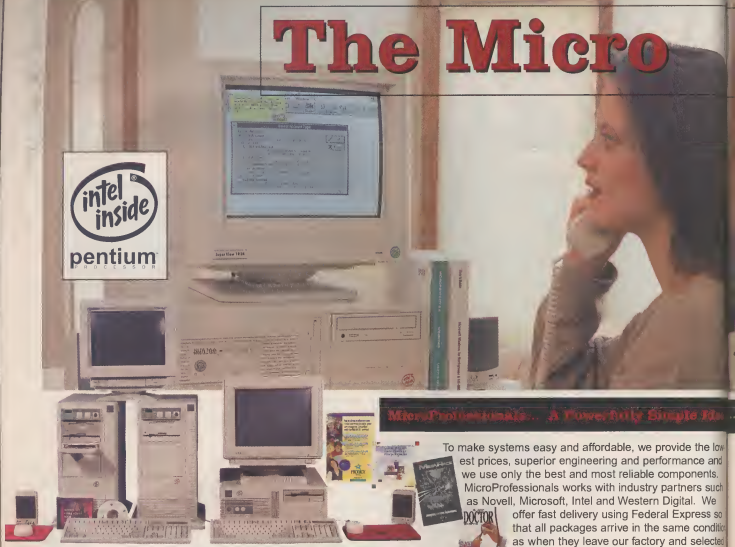

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P5/120 Pro Multimedia

- *Intel 120MHz Pentium Processor
- **16MB** Ram, 256 KB Fast Cache
- **1.2GB** IDE HD, 10ms, 128K
- 3.5" 1.44 MB Floppy Disk Drive
- 64-Bit PCI Bus Graphics Card w/2MB
- PCI Local Bus IDE Controller
- **15"** .28mm Flat Color Monitor
- Quad-Speed CD-ROM Drive
- 16-Bit Stereo Sound Card w/Speakers
- Enhanced 101 Key Keyboard & Mouse
- MS-Dos & Windows for Workgroups 3.11
- Quicken, Prodigy, Compuserve and America Online preloaded
- CD Disks: Word Perfect, Compton's Interactive Encyclopedia™, U.S.A. Travel, Mega Race and More!
- 11 Bay Mid-Tower
- *One Year On-Site Warranty*

$2,949 #5120-M2T16&J3

850MB IDE, 10ms	**$2849**	#5120-M8T16&J3
1.6GB IDE, 10ms	**$3149**	#5120-M8T16&J3

P5/100 Pro Multimedia

- *Intel 100MHz Pentium Processor
- **8MB** Ram, 256 KB Fast Cache
- **850MB** IDE HD, 10ms, 128K
- 3.5" 1.44 MB Floppy Disk Drive
- 64-Bit PCI Bus Graphics Card w/2MB
- PCI Local Bus IDE Controller
- **15"** .28mm Flat Color Monitor
- Quad-Speed CD-ROM Drive
- 16-Bit Stereo Sound Card w/Speakers
- Enhanced 101 Key Keyboard & Mouse
- MS-Dos & Windows for Workgroups 3.11
- Quicken, Prodigy, Compuserve and America Online preloaded
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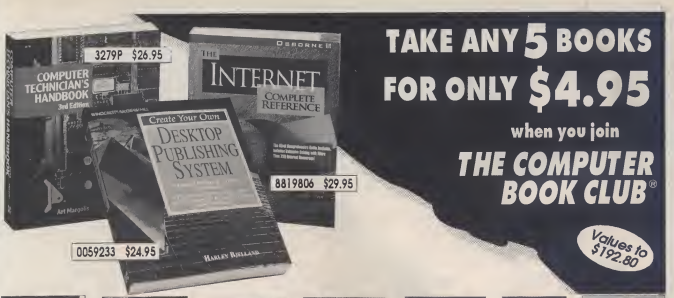

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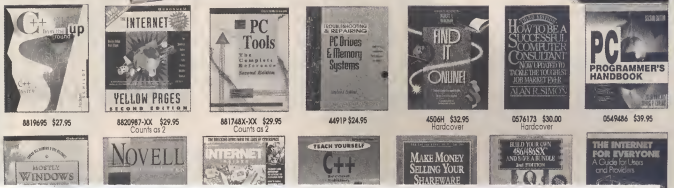

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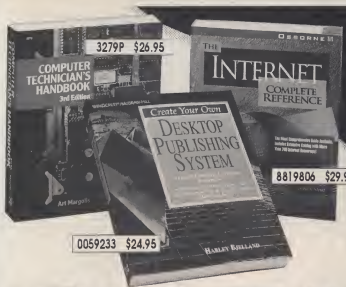

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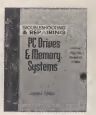
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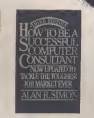
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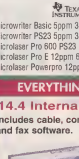

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256K CACHE

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NP8500

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11.3" OVERSIZED DISPLAY

VESA LOCAL BUS VIDEO

DOUBLE LIFE NIMH BATTERY

TRUE SOUND AUDIO SYSTEM

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Nothing can catch this portable when it's on the run. Our new NP7500 Pentium 100MHZ is the most advanced, highest performance notebook available today. It's also more powerful than most desktops. The Pentium CPU has twice the performance of a 486 DX-2/66 and the capability to crunch more than 100 MIPS. Add to this a 256K cache and the unsurpassed performance of VESA Local Bus Video and Local Bus IDE, and this notebook will get you where you're going fast.

256K CACHE

VESA LOCAL BUS VIDEO & LOCAL BUS IDE

BUILT-IN AUDIO SYSTEM

PENTIUM POWER

NP9500

- Intel Pentium or 486 CPU
- 1MB Video RAM
- 32-bit VESA Local Bus Video with Windows Accelerator
- 32-bit Local Bus IDE
- 256KB Secondary Cache Memory Expandable to 512KB or 1MB
- 16-bit Stereo Audio with 2 Stereo Speakers and 1 Microphone

486: 4MB Exp. to 64MB
Pentium: 8MB Exp. to 64MB
Removable 340MB Hard Drive (520, 810MB Opt.)
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Color VGA LCD Display Supports up to 640 x 480, 64K Colors
CRT: 1024 x 768, 256 Colors
Simultaneous CRT & LCD Operation
Integrated Pointing Device
Advanced Power Management with SMM
2 PCMCIA Type I & II or 1 Type III Slot
Super Long Life NiMH Battery
2 16C550 Compatible Serial Ports
1 Parallel Port with ECP/EPP Support
Other Ports: Game, Ext. Keyboard, Ext. VGA Monitor, Ext. FDD & 200 Pin Connector for Docking Station.
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Carrying Bag & AC/Adapter
Weight 7.5lbs. with Battery
11.61"W x 9.06"D x 2.44"H
Sager's Umbrella Protection Policy

NP9500 OPTIONS

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- 3.5" Removable FDD Module
- Car Adapter
- Numeric Keypad
- PCMCIA Cards

NP8500

- 11.3" Dual Scan Color VGA Display
  CRT: 1024x768, 256 colors
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- 32-bit VESA Local Bus Video with Windows Accelerator
- 16-bit Stereo Audio with 2 Stereo Speakers & 1 Microphone
- 4MB RAM Expandable to 20MB
- Removable 340MB Hard Drive (520, 810MB Optional)
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- Integrated Pointing Device
- Intelligent Power Management w/ SMM
- 2 PCMCIA Type I & II or 1 Type III Slots
- Extra Long Life NiMH Battery
- 1 16C550 Compatible Serial Port
- 1 Parallel Port with ECP/EPP Support
- Other Ports: Ext. Keyboard, Ext.VGA Monitor & 200 Pin Connector for Docking Station
- Jacks - 1 line in & 1 line out
- 86-Key Keyboard
- Microsoft DOS 6.22
- Carrying Bag & AC/Adapter
- Weight 5.9lbs. with Battery
- 11.81"W x 9.44"D x 1.65"H
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NP8500 OPTIONS

Docking Station
Numeric keypad
Car Adapter
PCMCIA Cards
(Fax/Modem, Ethernet, SCSI & more)

NP7500

Pentium:
- 256KB Secondary Cache
- 8MB RAM Expandable to 40MB
- 1 16C550 Compatible Serial Port
- 1 Parallel Port with ECP/EPP Support
- Color VGA LCD Display Supports up to 640 x 480, 64K Colors

486:
- 4MB RAM Expandable to 36MB
- 1 Serial & 1 Parallel Port

- 1MB Video RAM
- 32-bit VESA Local Bus Video with Windows Accelerator
- 32-bit Local Bus IDE
- 16-bit Stereo Audio with 2 Stereo Speakers & 1 Microphone
- Removable 340MB Drive (520, 810MB Optional)
- Color or Mono VGA Display CRT: 1024x768, 256 Colors
- Simultaneous CRT & LCD Operation
- Large Built-In 1Pmm Trackball and Hand Rest
- Intel Upgradeable CPU
- Intelligent Power Management with SMM
- 2 PCMCIA Type I & II or 1 Type III Slot
- Super Long Life NiMH battery
- Other Ports: Ext. keyboard, Ext. VGA monitor, & 200 Pin Connector for Docking Station
- Jacks - 1 line in & 1 line out
- 86-Key Keyboard
- Microsoft DOS 6.22
- Carrying Bag & AC/Adapter
- Weight 6.6lbs. (with Battery)
- 11 14"W x 9.48"D x 1.95"H
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NP7500 OPTIONS

Docking Station
Numeric keypad
Car Adapter
PCMCIA Cards
(Fax/Modem, Ethernet, SCSI & more

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NP7500	9.5" MONO	10.3" COLOR DUAL SCAN	9.5" COLOR ACTIVE MATRIX
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486DX4-100	$1595	$1995	$2575
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PC WORLD, April 1995

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64Kx4	–	11 00	9 00	8 00
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1Megx4 (Zip Pk)		24 00	22 00	21 00	–
256x4(Page Dip)	-	7 25	8 75	6 50	5 95
256 4(Static Dip)		–	9 95	-	–
256x4(Page Zip)	–	9 25	9 00	8 95	–
256x4(Video Zip)		-	12 95	11 95	9 95
256x8(SOJ)		29 00	24 00	-	
256 x1		3 25	2 95	2 75	2 25
64x4			–	3 75	–
64x1		-	–	-	2 00
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	16Meg	500987 004	479 00
	32Meg	500987 005	958 00
Premmia LX P/60 MX4/66d 4/100T P/60	8 Meg	500987 003	338 00
	16 Meg	501340 002	478 00
	32 Meg	500987 005	958 00
	64 Meg	501569 001	Call
Premmia 4133, 4133S, 4/50d, 4/60d	8 Meg	501159 002	338 00
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Manhattan G V Series Server	64 Meg	501159-005	2298 00
Power Premium 3/33 4/33 4/33S 4/50d 4/66d; Premium 486/25 486/25E 486/33 486/33E; Premium 386/33TE 486/25TE 486/33TE; Prem II 386/25 386/33 486/33 486 SX/20	8Meg	500780-001 } 72 pin	378 00
Bravo 486/25 486/33; Advantage 486/25 486/33 486/33P 486 SX/20	2 Meg Kit	500780-005	118 00
Premium SE4/22	8Meg Kit	500780 001	378 00
Premium SE 4/50 d 66d, P/60	1 Meg	500780 003 } 64 pin	59 00
Prem 386/33T, 386 SX16 Prem II 386SX 20 386/25	4Meg	500780 004	189 00
Premmia GX P/90 P/100	8Meg Kit/16Meg Kit	501565 001/501566 001	378/699
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Ambra Sprinte SLC II	2/8 Meg	89 00/319 00
Ambra N-75 N-100	4/8/16	189 00/369 00 659 00

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Z386/33, 25 20 33E 486/25E	4Meg	ZA3800MK	180 00
Z386SX	2Meg	Z-605-1 modules	119 00

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6451060 (4Meg)	80-A21 A-61 80-A31 80 111 80 311	189 00
6450604/92G7196 (2Meg)	70-061 E61 121 50Z 55SX 85SX P 70 55LS 65LS X-Station 120 8 130 35SX 35LS 40SX	98.00
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1057035 (512K)	P/S1-286	49 00
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DeskPro 386/33L 486/33L	(Exp Bd)	116569-001	278 00
DeskPro 386/25 386/20	1Meg Module	113131 001	79 00
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	4Meg Exp Bd	113634 001	279 00
	1Meg Module	113646-001	78 00
	4Meg Module	112534 001	199 00
DeskPro 386/20E	1Meg Exp Bd	113644 001	149 00
DeskPro 386/25E	4Meg Exp Bd	113645-001	279 00
	1Meg Module	113131-001	79 00
	4Meg Module	113132 001	199 00
DeskPro 286N 386N 386SX20 all "M" series sytem LT series all "I" series	1Meg Module	118688 001	59 00
	2Meg Module	118689 001	89 00
	4Meg Module	118690-001	169 00
	8Meg Module	126377-001	339 00
M Series Exp Bd	0-64Meg	129160-001	189 00
DeskPro 386/16	1Meg Kit	108071 001	99 00
	4Meg Kit	108072 001	299 00
	1 2Meg Exp Bd	108069 001	239 00
	4 8Meg Exp Bd	108070 001	437 00
DeskPro 286 } ALL OF THESE MACHINES USE THESE MODULES	512K Kit	113012 001	49 00
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LTE LITE/20 25 25C	8Meg Module	129769-003	389 00
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LTE LITE 425C/33C/25E/25L	4Meg Module	142337-002	189 00
LTE LITE 425C/33C/25E/25L	8Meg Module	142337-003	329 00
LTE LITE 425C/33C/25E/25L	16Meg Module	142337-004	839 00
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SLT/386	4Meg Module	118305-001	219 00
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	16Meg	144790-003	699 00
Contura 320, 325	2Meg	139497-001	99 00
	4Meg	139498-001	189 00
	8Meg	139499 001	339 00
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Aero 4/25 4/33L	4Meg	190532-001	184 00
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T2000SXE/2200SX/T1600 1850 C	2Meg	PC PA2000U	[illegible]
T2000SXE/2200SX/T1800 1850 C	4Meg	PC PA2001U	[illegible]
T2000SXE/2200SX/T1800 1850 C	8Meg	PC-PA2002U	[illegible]
T2100 2105 2150	[illegible]Meg/8Meg		[illegible]
T2100, 2105, 2150	16Meg/24Meg		[illegible]
T4400SX SXC T6400 T6600	4Meg	PC-PA2004U	[illegible]
T4400SX SXC T6400 T6600	8Meg	PC PA2005U	[illegible]
T4400SX, SXC T6400, T6600	16Meg	PC-PA2010U	[illegible]
T4500 C T4600, T4700 T1900 C, T1910, T1950 (3 3 v)	4Meg	PC-PA2012U	[illegible]
T4500 C T4600 T4700 T1900 C, T1910, T1950 (3 3 v)	8Meg	PC-PA2013U	[illegible]
T4500, C, T4600 T4700 T1900 C, T1910 T1950 (3 3 v)	16Meg	PC-PA2014U	[illegible]
T4700, 4800 4850 (Hard Drive)	524Meg/710Meg		[illegible]
T3400CT T2400 T3600	4Meg	PC-PA2019U	[illegible]
T3400CT T2400 T3600	8Meg	PC-PA2020U	[illegible]
T3400CT T2400, T3600	16Meg	PC-PA2021U	[illegible]
T3400CT	32Meg		[illegible]
T3100SX	2Meg	PC15 PA8308U	[illegible]
T3100SX	4Meg	PC15 PA8310U	[illegible]
T3200	3Meg	PC6-PA7137U	[illegible]
T3200SX	2Meg	PC12 PA8307U	[illegible]
T3200SX	4Meg	PC12 PA8909	[illegible]
T5200/T8500	2Meg	PC10 PA8304U	[illegible]
T5200/T8500	8Meg	PC10 PA8313U	[illegible]

NOTEBOOK, LAPTOP MEMORY

MODEL	AMT UPGRADED	MANU PART #	PRICE
ACER 730 735C 760 780	2Meg/4Meg/8Meg		[illegible]
ACER 750	4Meg/8Meg/16Meg		[illegible]
ALR Venture	4Meg	12407980	[illegible]
Allima Virage	4 Meg/ 16 Meg		[illegible]
Allima Virage II	4Meg/8Meg/16Meg		[illegible]
AST Ascentia 900N 800N	4Meg/8Meg/16Meg		[illegible]
AST Bravo & Explorer	4Meg/16Meg	501255-001 -002	[illegible]
AST Notebook Prem Exec 386SX/20/25/25L	4Meg	500814 003	[illegible]
AST Power Exec 3/25C, 425EL, 425SL	4Meg/16Meg	501166 001 -003	[illegible]
AST Power Exec 4/33SL	4Meg/16Meg	501318-001,002	[illegible]
AT&T Globalyst 200	4Meg/8Meg/16Meg		[illegible]
AT&T Safari NSX/20	4Meg	PEC 37651	[illegible]
Austin DX4, DX2, SX2, SX Series	4Meg/16Meg		[illegible]
Bondwell B310, Plus	1Meg	23050-09100	[illegible]
Bondwell B310V SX	1Meg		[illegible]
Bondwell B310V SX	4Meg		[illegible]
Canon Innova Book 150	4Meg/16Meg		[illegible]
Canon Innova Book 200LS	4Meg/8Meg/16Meg 24Meg		[illegible]
Canon Innova 486	2Meg/4Meg/8Meg		[illegible]
Canon Innova 486 10	4Meg/16Meg		[illegible]
Canon Notejet 486	4Meg/ 8 Meg		[illegible]
Chaplet 486	4Meg/16Meg		[illegible]
Chicony NB5	4Meg/16Meg		[illegible]
Compuadd 425TX Notebook	4Meg/16Meg		[illegible]
DEC HiNote	4Meg/8Meg/16Meg		[illegible]
Dell Latitude M, MC, MCX	4Meg/8Meg/16Meg		[illegible]
Dell Latitude XP 475 4100, 4100CX	4Meg/16Meg		[illegible]
Dell Latitude 486 425 433C 433CX 450 450CX	4 Meg/16 Meg		[illegible]
DTK 4T100P Notebook	4Meg/8Meg/16Meg/32 Meg		[illegible]
Epson ActionNote 650 650c	4Meg/8Meg/16Meg		[illegible]
Epson ActionNote 700 700c 700cx	4Meg/16Meg		[illegible]
Epson ActionNote 4000 Notebook	6Meg		[illegible]
Epson ActionNote 4LC/25, 4LC/33 4SLC/2-50			[illegible]
Everex Tempo LX, LX20, Carrier	2Meg	PCA 00053 0001	[illegible]
Gateway 2000 Colorbook 4/33	4Meg/16Meg		[illegible]
Gateway 2000 Nomad 425 DXL/SXL	4Meg/16Meg		[illegible]
Gateway 2000 486 Handbook	4Meg/16Meg		[illegible]
Goldstar GS520 386SX/16	4Meg	S386-4M	[illegible]
HP Omnibook 300 430 425	2Meg/4Meg		[illegible]
HP Omnibook 530, 600	4Meg/8Meg/12Meg		[illegible]
HP Omnibook 4000	4Meg/8Meg/16Meg		[illegible]
Leading Edge Aviva	4Meg/16Meg		[illegible]
Lexmark SE10	4Meg/8Meg		[illegible]
Magnavox Metalis	1Meg/4Meg	286 386SX	[illegible]
Midwest Micro Elite SX 25 SX33, DX2 50 DX2-66	4Meg/8Meg/16Meg		[illegible]
Midwest Micro Elite 486 SLC 33 Subnotebook	4Meg/8Meg/16Meg		[illegible]
Midwest Micro Elite Sndbk SX33 DX3-50, DX4 75 DX4 100	4Meg/8Meg/16Meg		[illegible]
Midwest Micro Elite Sndbk Plus D5-75 D5-90	4Meg/8Meg/16Meg		[illegible]
NCR Safari 3180	4Meg/ 8 Meg		[illegible]
NEC Prospeed 386	2Meg	PC31 21	[illegible]
NEC Prospeed 386	8Meg	PC31-22	[illegible]
NEC Prospeed 286 386SX 16 386SX 20	4Meg	PC21-22 PC43 22	[illegible]
NEC Ultralite Versa E V	4 Meg/8Meg/16Meg/20Meg	OP4104	[illegible]
NEC Versa Removable Hard Drive	340Meg/524Meg/710Meg		[illegible]
NEC Versa S	4Meg/8Meg/16Meg		[illegible]
Packard Bell 386SX 286	1Meg 4Meg	286 386SX	[illegible]
Packard Bell Statesman	2Meg/8Meg		[illegible]
Panasonic CF170 CF270 CF370	1Meg	CF-8A165	[illegible]
Panasonic CF380, CF460	2Meg/4Meg/6Meg		[illegible]
Panasonic CF V21P CF-580	4Meg/16Meg		[illegible]
Sanyo 17/18 NB	2Meg	MBC N8MEM2	[illegible]
Sharp 6781 6881 6785 6700 6800 6741	2Meg/4Meg		[illegible]
Sharp 8150 8650 8660 7700 7760	4Meg/16Meg		[illegible]
Sharp 8700 & 8900	4Meg/8Meg/16Meg		[illegible]
TI Travelmate 2000	1Meg	2568034 0001	[illegible]
TI Travelmate 3000	2Meg	2566996-1	[illegible]
TI 4000, TI 4000E	4Meg/16Meg		[illegible]
TI 4000M	4Meg/16Meg		[illegible]
TI 5000	4Meg/16Meg		[illegible]
Tandy 1510 2810 3810	1Meg		[illegible]
Tandy 2820 3820 3830	2Meg/4Meg/6 Meg		[illegible]
Twinhead Altima Compudyne 486SX DX Tandy 4800	4Meg/16Meg		[illegible]
Twinhead Slimnote 5	4Meg/8Meg/16Meg		[illegible]
Ultra 486 TS36	4Meg/8Meg/16Meg		[illegible]
Zeos 386SX Notebook (not the + version)	2Meg		[illegible]
Zenith Master Sport 386SX	2Meg	ZA-300 1	[illegible]
Zenith Master Sport SL SLE, 600 620 625NL	2Meg	ZA 4 4	[illegible]
Zenith Super Sport 286 286E	1Meg	ZA-180-66	[illegible]
286E SX	2Meg	ZA 180 64	[illegible]
SX Alpha/SX Beta	2Meg	ZA 180-86/ZA 180-87	[illegible]
Zenith Z Note 425LN LNC LNP	4/8/16Meg		[illegible]
Zenith Z Star 4/33	2/8Meg		[illegible]

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Canon LBP 860	–	–	–	99	–	–	179	–	–	349	569	[illegible]
Canon LBP4, 4Lite, 4plus	–	–	159	219	–	–	–	–	–	–	–	–
Epson 6000 Action Laser	–	–	–	139	–	–	229	–	–	–	–	–
Epson Action Laser 1100 1600	–	–	69	99	–	–	189	–	–	379	599	–
Epson Action Laser II	–	–	89	–	208	–	–	327	–	–	–	–
Epson 8000 1800 4000 4100, 4300	–	–	89	–	208	–	–	327	–	Call	Call	Call
Epson 1000, 1500, 5000 5200	–	–	–	***119***	–	–	***236***	–	***Call***	–	–	–
HP 2 2D–	–	–	–	109	–	–	189	–	–	–	–	–
HP 3 3D 3P, 2P 2P+	–	–	–	99	–	–	169	–	–	–	–	–
HP 4 4M 4SI 4SIMX 4P 4MP	–	–	–	89	–	–	169	–	–	348	–	–
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HP 3SI	–	–	69	–	–	–	169	–	–	348	–	–
HP 4SI	–	–	–	89	–	–	175	–	–	349	–	–
HP Design Jet 600, 650, 200	–	–	–	89	–	–	175	–	–	349	–	–
HP Deskjet 500 500C, 510 550 560	–	55	–	–	–	–	–	–	–	–	–	–
HP Deskjet 1200C 1200C/P	–	–	–	89	–	–	175	–	–	349	–	–
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IBM Laser 4019 4019E	–	–	–	–	–	169	–	–	–	–	–	–
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Konica LP-3110	–	–	119	189	239	–	–	–	–	–	–	–
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Oki 400	–	–	–	84	–	–	–	–	–	–	–	–
Oki 400E, 400EX 410E 410EX	–	–	135	189	–	–	–	–	–	–	–	–
Oki 830, 840	–	–	–	109	–	–	–	–	–	–	–	–
Packard Bell PB 9500	–	–	–	139	–	–	227	–	–	–	–	–
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Panasonic 4420/4450i	–	–	–	129	–	–	229	–	–	–	–	–
Panasonic 4410/4430	–	–	–	126	–	–	195	–	–	–	–	–
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Panasonic 4440, 5410	–	–	109	179	–	–	Call	–	–	–	–	–
Sharp 9400 9460 9600, 9700E	–	–	89	149	–	–	249	–	–	–	–	–
Sharp 9500, E, H, 9700 H	–	–	109	–	–	–	279	–	–	–	–	–
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PRODUCTS FEATURED IN EDITORIAL

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631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650
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846	847	848	849	850	851	852	853	854	855	861	862	863	864	865	866	867	868	869	870
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Please answer questions below:

1. Where do you use your computer? (Check one only)
A. ☐ Home B. ☐ Business C. ☐ Both

2. What kinds of computers do you use? (Check all that apply)
D. ☐ IBM/Compatible Laptop E. ☐ IBM/Compatible Desktop F. ☐ MAC

3. Do you plan to buy any of the hardware or software mentioned below in the next 12 months? (Check all that apply)

HARDWARE
G. ☐ PC
H. ☐ MAC
I. ☐ Laptop
J. ☐ Printer
K. ☐ Monitor
L. ☐ Disk/Tape Back-up
M. ☐ Add-in Board
N. ☐ Modem
O. ☐ Input Device
P. ☐ Local Area Network

SOFTWARE
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S. ☐ Personal Finance
T. ☐ Desktop Publishing
U. ☐ Word Processor
V. ☐ Database Manager
W. ☐ Graphics
X. ☐ Utility
Y. ☐ Communications
Z. ☐ Windows/Multi-tasking
1. ☐ Programming Language/ Compiler
2. ☐ Integrated/Multifunction
3. ☐ CAD
4. ☐ CD-ROM
5. ☐ On-Line Services

4. From which of the following sources do you purchase personal computer products? (Check all that apply)
5. ☐ Specialty Computer Retail Stores
6. ☐ Mail Order Firms
7. ☐ Direct from Manufacturers
8. ☐ Other

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Circle the numbers below corresponding to products featured in this issue's advertisements and listed in the Editorial Product Index. Manufacturers will mail product literature to you free of charge.

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N. ☐ Modem
O. ☐ Input Device
P. ☐ Local Area Network

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T. ☐ Desktop Publishing
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V. ☐ Database Manager
W. ☐ Graphics
X. ☐ Utility
Y. ☐ Communications
Z. ☐ Windows/Multi-tasking
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1mbyt X 9	35	37	41	51	2 X 32 & 4 meg	148	170	198	
1mbyt X 9	34	40	42	46	2 X 32			300	
4 X 9 only			104		4 X 32 & 8 meg	320	368		376
4 meg X 9		129	138	148	4 X 32			480	
16 meg X 9	126	135			8 X 32 & 16 meg	518	535	595	
					8 X 36 32 meg		1175	1275	
					16 X 36 64 meg		2695		

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2540	540 mb	11 ms	3.5" IDE	189
7540	540 mb	11 ms	3.5" IDE	248
71250	1.2gig	11 ms	3.5" IDE	349
CONNER				
CFS420A	420 mb	12 ms	3.5" IDE	176
CFS540A	540 mb	12 ms	3.5" IDE	247
CFS850A	850 mb	10 ms	3.5" IDE	355
CFA1275	1.27 gb	10 ms	3.5" IDE	549
SEAGATE				
ST3660	545 mb	12 ms	3.5" IDE	190
ST31270A	1.08 mb	10 ms	3.5" IDE	525
ST32550A	1.05 gb	9 ms	3.5" IDE	549
WESTERN DIGITAL				
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2540	540 mb	11 ms	3.5" IDE	249
2850	850 mb	11 ms	3.5" IDE	349
31200	1.2 gb	11 ms	3.5" IDE	359
QUANTUM				
LPS 540A	540 mb	9.5 ms	3.5" IDE	182
SCSI DRIVES				
Conner CFP1060S	1.06 gb	9 ms		479
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SEAGATE ST-NODISK				
ST32550N	1.1 gig cache, 7200 rpm, SCSI-2 fast, 2 gb	8 ms		996

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	8mb	60G0376	339
	16mb	60G0379	647
Thinkpad 500, 510CS, 2518	4mb	81B5068	198
	8mb	81B5069	398
	16mb		848
CL755X	4mb	07G1420	208
Thinkpad 700, 700C, 700, 720C, 750C			
	8mb	07G1421	378
	16mb	9G6519B	695
Thinkpad 710T	4mb	n/a	188
	8mb	n/a	318
PS/Note N650L	2mb	90F8804	108
PS/2, N51, SLC, SX	2mb	07G1855	98
	4mb	07G1857	168
	8mb	07G1858	418
Laptop N33SX, L40SX & PSNOTE 140			
	2mb	79F8999	98
	8mb	79F1000	184
L40SX, PSNOTE 190 only	4mb	79F1001	358

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Model	Memory	Part #	Price
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T3100SS,	2mb	PA2080U	118
	4mb	PA2007U	238
	6mb	PA2008U	258
	16mb	PA2009U	698
T3400CT	4mb	PA2019U	218
	8mb	PA2020U	349
	16mb	PA2021U	758
T4400 SX, SXC, T6400 SXC, DXC			
	2mb	PA2002U	125
	4mb	PA2004U	198
	8mb	PA2005U	338
	16mb	PA2010U	698
	32mb		1548
T4500, T4900, T1900C	4mb	PA2012U	198
(3.3volts) T4700	8mb	PA2013U	368
	16mb	PA2014U	698
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T5200/T5200C/T5600/T5400	2mb	PA2804U	109
	8mb	PA2813U	418

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486 DX/25S	196	
486 DX/40TS	358	
486 DX4/100	378	
Pentium 60	379	
Pentium 66	419	
Pentium 90	698	
CPU Cooling Fan	15	

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70ns 1M Mhz	49
60ns 2M Mhz	69
80ns 2M Mhz	74
70ns 2M Mhz	79
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70ns 4M Mhz Cpm	79
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	4mb Module	141684-001 178
	8mb Module	141685-001 338
Compaq Pro Signine	16mb	143020-001 694
	32mb	149141-001 1534
DeskPro 5/60, 5/66M	8mb	149911-001 388
Prosignia PC Server, 486/33/66	8mb	141685-001 348
	16mb	143020-001 648
	32mb	149147-001 1498
Prosignia 5/90	16mb	149849-001 698
Proliant 100 5/90	32mb	149912-001 1398
Proliant 2000 4/33,5/66	64mb	149913-001 2998
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4200 MB CFP4207 9MS 3.5" IMI SCSI		$1310

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1080 MB 31220A 12MS 3.5" IMI IDE		$322
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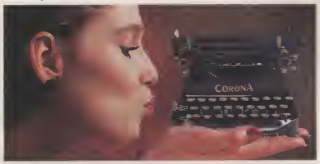

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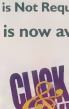

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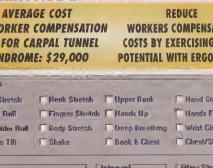

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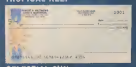
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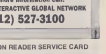

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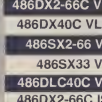

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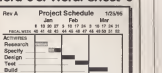

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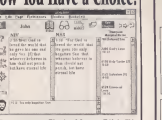

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Software Watch 95

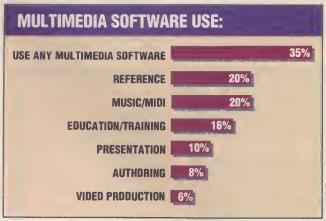
Your update on software trends and product advertising.

Stop, Look, Listen

Multimedia at the Crossroads

Let's face it — hardware ain't nothin' but a software enabler. All the fast processors, video and sound cards, CD ROM drives and large-screen monitors you see on the shelves of your local computer store and the pages of your favorite computer magazine are there for one reason only — so you can run the coolest of the multimedia software out there. And what a wealth of options you have.

Dataquest estimates that multimedia software will grow to be a 1.8 billion dollar worldwide market in 1995. More new multimedia products of all kinds hit the shelves every day — products for home, for business, and for entertainment. Now your computer can bark like a dog, fly like an F15 or present like Zig Zigler. So whether you need to spice up a presentation or just distract your children for a while, you can find the multimedia software that fits your bill.



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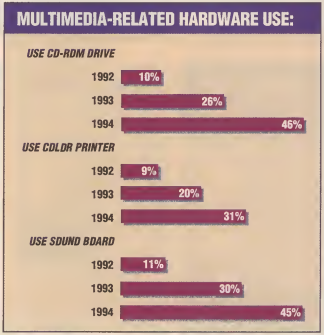

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WEB WINDOW SHOPPING

Big Mall, Small Sales

No Thanks, Just Looking: Few have seen success selling on the Net, where there are many lookers but few takers.

Hoping to double sales, you've rushed to take your successful business online. It's opening day, and the place is packed—you've recorded more than 200,000 "hits" (or visits) from Web consumers the world over. But while there are plenty of browsers, there are few buyers. Surprised? Don't be. Business sales on the Internet are not booming, at least not yet.

Although hundreds of companies are flooding the Web with goods for sale—everything from flowers to cars—shopping online is still in its infancy. According to Forrester Research, last year American consumers spent more than $1.5 trillion in retail stores and a mere $200 million online. It's only the smartly targeted niche campaigns that have enjoyed success online.

One successful campaign is IndustryNet Online Marketplace (http://www.industry.net), which brings together more than 100,000 buyers and 3,000 suppliers of various technical and engineering products and services. The results are impressive: sales of $10 million in 1994 and projected sales of $28 million in 1995.

Another online sales effort that's cultivating success is Virtual Vineyards (http://www.virtualvin.com). Master sommelier Peter Granoff personally selects and reviews the wine he sells. There's also a moderated forum, a wine glossary, and a question-and-answer section. Since a quiet launch earlier this year, sales have doubled each month.

While a few other online sales efforts have seen limited success, most of the shoppers are tire kickers—not people ready to spend money. And until online shopping catches on the way traditional channels have, you'd be wise to proceed with caution.

ONE-MINUTE GUIDE Such a Bargain! Web Shopping Sprees

Shopping at the local mall is out of the question—too many people, not enough parking. Try these online malls out for size:

BIBLIOBYTES A boon for book lovers (http://bb.com/).

CYBERMALL Links to a dozen Web malls (http://199.171.5.200/CyberMall.html).

CYBERSOURCE'S SOFTWARE.NET Cheap software (http://software.net).

DEALERNET Cars, parts, and accessories (http://www.dealernet.com/).

INTERACTIVE SUPER MALL Links to hundreds of shopping opportunities (http://www.supermall.com/).

THE INTERNET MALL Food, clothes, and more (http://www.mecklerweb.com/imall).

INTERNET PLAZA Links to other malls (http://plaza.xor.com/).

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THE VIRTUAL RHEINGOLD Check out the Pixel Theater at noted technology journalist Howard Rheingold's home page.
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I WANT MY WEBTV! Beavis and Butt-head meet HTML at the MTV home page.
http://www.mtv.com/

SAN FRANCISCO TREAT KPIX Television and Radio has a camera set atop Nob Hill's Fairmont Hotel offering an instant view of Baghdad by the Bay 24 hours a day.
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Size/Time*: 270K/8

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Easter Eggs—How to Get There ****
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PC Contact: webmap.zip/Library 5 **Size/Time*:** 983K/20

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Package Deals: We Wrap It Up, You Take It

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PC Contact, Library 10
eggcam.zip
1.2MB/28
*****

SAVERS TO SAVOR
Kick back to a collection of shareware screen savers you won't find in your Windows directory: random patterns, clocks, and more, plus a routine that cycles through them.
PC Contact, Library 0
savers.exe
104K/5
*****

WINDOWS PRANK KIT
Disclaimer: We're not suggesting you pull a prank on a Windows-running colleague. But if you want to know how, this unique resource kit can teach you a thing or two.
PC Contact, Library 10
prank.zip
19K/1
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1. Call CompuServe at (800) 848-8199 for a local access number.

2. Set your software to 7 data bits, even parity, 1 stop bit, full duplex, and dial the service.

3. Press Ctrl-C to get the system's attention, and at the HOST NAME prompt, type CIS and press Enter.

4. For USER ID, type 177000,5300, and at the PASSWORD prompt, type PC/CONTACT.

5. At the ENTER AGREEMENT NUMBER prompt, type PCC95.

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You Know the Drill: If not, pick up valuable home-maintenance tips here.

HOME REPAIR ENCYCLOPEDIA 2.0

●●●●●

This is the answer to a do-it-yourself home owner's prayers. Like any good reference source, Home Repair Encyclopedia 2.0 is authoritative and comprehensive. Its videos, animations, and text teach everything from eliminating termites to tile grouting (though not building an addition; Books That Work has other titles for that). Now even a thumb-banger like me understands how to search for studs and brace for earthquakes. I had a hard time coming up with a topic that I couldn't find in Home Repair Encyclopedia—except for hanging wallpaper, which I can live without. The summary: If you're going to do it right, don't do it by yourself; do it with this CD.

Home Repair Encyclopedia 2.0 / Books That Work / (800) 242-4546, (415) 326-4280 / $30 est. street price / *Reader Service No. 711*

3D HOME ARCHITECT

●●●●

Well, if you think repairing a home is fun, you'll have a ball building one with 3D Home Architect. This Windows disc gives you a collection of tools to make it easy to lay out your dream home, try a few new walks and windows in your existing home, or simply move the furniture around without slipping a disk. But once you get serious about this business, it quickly becomes real work. There are a lot of details such as measurements and electrical doodads to take into account. However, if you're the type who spends a week mapping a family vacation, you'll love the detailed control this program gives you. In fact, with any luck, you may never have to pick up a hammer.

3D Home Architect / Broderbund Software / (800) 521-6263, (415) 382-4400 / $70 est. street price / *Reader Service No. 712*

This Is Not My Beautiful House: But with 3D Home Architect it may be.

EXPERT HOME DESIGN GOLD CD-ROM

●●●

This disc takes a more prosaic approach to the territory covered by 3D Home Architect. There's no 3-D in Expert Home Design Gold CD-ROM, and the multimedia is limited to slide shows of home improvement ideas and a selection of background music from blues to bossa nova. Otherwise it basically lets you do the same things as 3D Home Architect. The only serious problem is that it's hard to see an entire house layout all at once. A 17-inch monitor and high-resolution video are a big help.

Expert Home Design Gold CD-ROM / Expert Software / (800) 759-2562, (305) 567-9990 / $30 est. street price / *Reader Service No. 713*

3D DECK

●●●●

If you're ambitious enough to even *consider* building a deck for your home, you have my undying respect. Of course, my respect alone never got anyone's deck built. What you really need is 3D Deck. This Windows CD has the same type of helpful videos and animations as the previous discs, but it throws in a designer that lets you easily create deck blueprints. First you push and pull a drawing into whatever shape you like, then you see the drawing in 3-D. The program also keeps a running account of costs and produces a customized shopping list. This is do-it-yourself in style.

3D Deck / Books That Work / (800) 242-4546, (415) 326-4280 / $50 est. street price / *Reader Service No. 714*

3D LANDSCAPE

●●●●●

More 3-D, anyone? If you bit into the premise of 3D Deck, you'll gobble down 3D Landscape because it's even more fun. As the designer, you populate a

●●●●● *Buckingham Palace.* ●●●● *A stately colonial with a den.* ●●● *A tract home in the burbs.* ●● *A cardboard box in the middle of the road.* ● *Your parents' place.*

PHOTOGRAPH BY JAMES McGOON

yard willy-nilly (or with taste) using trees, shrubs, flowers, ponds, boulders, and even lawn chairs. The program shows you how shadows—at your latitude, of course—will be cast at different times of the day or year and how individual plants will look after years of cultivation. There are growing tips for all the plants, and there's even a way to figure out how much your sylvan fantasy will cost you.

3D Landscape / Books That Work / (800) 242-4546, (415) 326-4280 / $50 est. street price for each / *Reader Service No. 715*

SIMPLY HOUSE ○○○

Simply House is simply OK. Based on *The Stanley Complete Step-by-Step Book of Home Repairs and Improvements*—the best book I've seen with a title that long—it has a lot of solid information for the weekend handyman.

The best way to navigate the disc is by using menus. This may be premultimedia, but it's the most efficient. Besides, the multimedia touches are afterthoughts—nailed-on elevator music and videos by Bob and Linda (who I'll bet have never held a screwdriver unless it was in a glass). This is essentially a text-based CD with illustrations from the book. But you're better off with the book. It's easier to take into the attic or under the house than a PC.

Simply House / 4Home Productions / (800) 773-5445, (516) 342-2000 / $45 est. street price / *Reader Service No. 716*

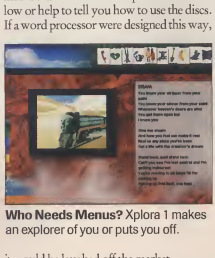
COMPLETE GUIDE TO GARDENING ○○

This is a beautifully designed CD-ROM with colorful borders on every screen that resemble stained glass. The photographs of gardens and plants are gorgeous enough to make you ashamed of your own pitiful attempts at landscaping. But beauty isn't everything. Moving through this Windows title is laborious. The search function is available only in parts of the program. The multimedia is limited to voice-overs—no animations or video. Yes, it's one of those: a CD-ROM with no excuse for being. Get the version that comes with a book; you'll need it.

Better Homes and Gardens Complete Guide to Gardening / Multicom Publishing / (800) 850-7272 / $40 est. street price / *Reader Service No. 717*

XPLORA 1 PETER GABRIEL'S SECRET WORLD ○○○

Ever since I heard raves about the Mac version of Xplora 1 Peter Gabriel's Secret World, I've been waiting patiently. After all, Gabriel is the best rock musician who looks like a dork (with Elvis Costello running a close second). But now that the disc is on Windows, I'm not sure it was worth the wait. We've seen a lot of CD-ROMs tied to music performers, and in all of them, getting there is supposed to be half the fun. This means that there are no simple menus to follow or help to tell you how to use the discs. If a word processor were designed this way,



Who Needs Menus? Xplora 1 makes an explorer of you or puts you off.

it would be laughed off the market.

Of course, this isn't a word processor, and I would have to be grumpier than usual to insist on taking the play and surprise out of an entertainment CD. But getting there would be more fun if the trip didn't take so long. Loading different elements of the CD is tedious, and too often the payoff is marginal. Morphing passport photos are cool, but only the first time. Not cool are the home movies of (I guess) Gabriel as a kid; that's groupie stuff. The most added value comes from samples of folk music from around the world and the music from albums produced by Gabriel's record company.

For me, most of the fun on Xplora comes from three Gabriel songs with computer-animated videos, but you can see these on VH-1 if you watch long enough. I really wanted to like this CD more than I do, especially because part of it is devoted to such worthy causes as Amnesty International. I suppose we're in the early stage of CD-ROMs when artists and programmers are still fumbling about trying to find a balance between creativity and technology. This CD doesn't have it yet.

Xplora 1 Peter Gabriel's Secret World / Interplay Productions / (800) 969-4263, (714) 553-6655 / $55 est. street price / *Reader Service No. 718*

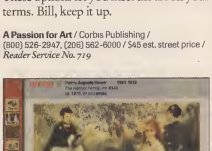
A PASSION FOR ART ○○○○○

It's no secret: Microsoft's Bill Gates has been buying up the digital rights to the world's great art. This Windows and Mac CD comes from his *other* company, and if it's any indication of his plans, we're all the richer for his work (though not as rich as Bill, of course).

The CD is an expertly guided tour of the collection of Dr. Albert Barnes, a wealthy visionary who closed his Renoirs, Rousseaus, and Picassos to the public when Pennsylvania citizens ridiculed them in a 1925 exhibit. The collection's reemergence would be significant even if the paintings were tossed together on a disc, but A Passion for Art is done so well that it's a showcase of fine art *and* CD design.

You wander through a black-and-white gallery where color is used only to display paintings that get in-depth treatment. Click on any of these artworks to zoom in for a closer look. Each has intelligently written text that's hypertexted to related topics or a spoken explanation of the art. You can take guided tours of the gallery's rooms or tour by subject matter or artist. These options let you meet the art on your terms. Bill, keep it up.

A Passion for Art / Corbis Publishing / (800) 528-2947, (206) 562-6000 / $45 est. street price / *Reader Service No. 719*



Art for Art's Sake: The long-hidden Barnes collection is now open.

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TechnoDial

Phone Tools for Voice, Video, and

BY JAMES OLIVER CURY AND

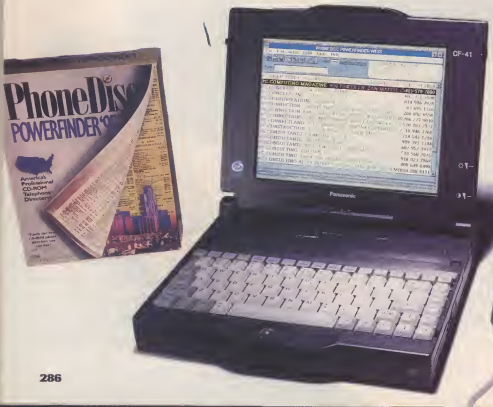
PBX systems? Pah! Cellular phones? Yawn. Dick Tracy, eat your watch off. Take a look at these BIOS-based Baby Bells. Today's telecommunications tools may be even stranger looking than Maxwell Smart's shoe phone, but they're far more convenient, reliable, and powerful. Whether you're at your office, at home, or on the road, you're just a click away from a dial tone.

Watch Time Go By: Can't walk and talk at the same time? The not-yet-released TeleWatch is reason enough to learn. It's the only cordless phone we know of that comes with a strap.

TeleWatch / MicroTalk Technologies / (612) 545-2627 / $350 list / *Reader Service No. 721*

Is That a Phone in Your Pocket . . . Or are you just glad to hear from me? With modem and PC card slots to spare, Motorola's Envoy PDA packs the phone features without the phone cord.

Envoy / Motorola Wireless Data Group / (800) 894-7353 / $999 to $1,499 est. street price depending on online service option / *Reader Service No. 722*



Phone Box 95: The Octus PTA fits between your modem and the phone line for voice mail, speed dialing, and phone management. The only thing missing is a phone book; try the PhoneDisc PowerFinder '95 CD-ROM.

Octus PTA / Gintech Tele-Management Systems / (800) 833-3900 / $229 est. street price / *Reader Service No. 723*

PhoneDisc PowerFinder '95 / Digital Directory Assistance / (800) 284-8353 / $150 est. street price / *Reader Service No. 724*

Data—At Home and on the Road

MATTHEW LAKE

It's Not a Power Strip: Phone Director (above) lets you dial in and turn on your peripherals. Creative Labs offers desktop video on your PC via regular phone lines for cheap (upper right).

Phone Director / Newpoint Corp. / (800) 639-7646 / $79.99 est. street price / *Reader Service No. 725*

Sharevision PC3000 / Creative Labs / (800) 998-5227 / $1,400 est. street price / *Reader Service No. 726*

Learn to Adapt: The Konexx acoustic couplers (left) and line noise filters (center) are lifesavers if the phone has no RJ-11 connectors or the line crackles like a pig on a spit. If the RJ-11 jack is in the wrong room, RCA's wireless link (far right) adds an invisible extension cord you won't trip over.

Konexx Konnector and **Konexx Acoustic Koupler** / Unlimited Systems Corp. / (800) 275-6354 / $159 and $149 list, respectively / *Reader Service No. 727*

Wireless Phone Jack System / RCA / (801) 566-0100 / $99 list / *Reader Service No. 728*

Attack of the Hybrids: Your keyboard is ringing? You're doing data entry on your telephone? Yep, this is technological crossover coming full circle—a keyboard with a phone and a phone with a keyboard. Plug a headset into CompuPhone (left), and it's a 101-key telephone. The Philips Screen Phone (right) combines smart card smarts with online access so you can pay bills in real time with a swipe of your credit card.

CompuPhone 2000 / Integrated Technology USA / (800) 393-8889 / $139.95 list / *Reader Service No. 729*

The Philips Screen Phone / Philips Home Services / (800) 284-2428 / $699 list / *Reader Service No. 730*

PHOTOGRAPHY BY ERNIE FRIEDLANDER

Wish List 95

The Official Story: "The Microsoft Exchange client is an advanced messaging and workgroup client that is built directly into Windows 95. It . . . works equally well whether connected over the local area network, or by way of a Dial-Up Networking connection [and] includes an OLE-compatible rich-text editor used for composing and reading messages, for powerful custom views, and for searching and filtering capabilities."

The Inside Story What's not to like about the Microsoft Exchange client? It's bursting with great ideas like these:

- A universal in-box that keeps e-mail, faxes, and files in one convenient place.
- Message transports for Microsoft Mail, Internet mail servers, CompuServe mail, and The Microsoft Network.
- Rich text (fonts, colors, indenting, and so on) that is able to travel across any transport, so long as there's an Exchange client on both sides of the mail link.
- A genuinely usable interface that lets you sort, filter, and view messages in a variety of ways, and then reorganize them by dragging and dropping them from one folder to another.
- A personal address book that links to Windows 95's Phone Dialer applet and possesses the beginnings of an acceptable PIM.

With all those features, what else could you want? I'm glad you asked. The trouble with an applet that's as ambitious as Microsoft Exchange is that it inspires wish lists like this one:

Superior Dial-Up Support In Exchange's initial incarnation, you can't automatically connect to your dial-up Internet provider, transfer mail between your PC and a mail server, and then disconnect. That's too bad. Exchange developers blame the fact that they can't count on users getting a reliable connection every time; it sounds more like the developers ran out of time.

Better Text Handling In the wide, wild world of the Internet, an Exchange user is more likely to run into someone running Qualcomm's Eudora than into another Exchange user. In that lowest-common-denominator link, why doesn't Exchange let you "quote" a portion of your original message—distinctively marking a chunk of text so that a correspondent with a text-based mail reader can easily distinguish the new portions of a reply from the original message? That feature works only when two Exchange users are talking.

Replication Lotus Notes lets you keep multiple copies of databases and message stores in perfect sync across multiple servers, and so should Exchange. That feature is promised in the long-delayed Exchange server software. This year? Not likely.

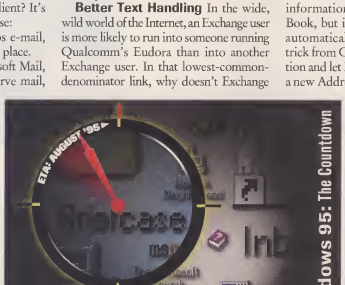
Agents Wouldn't it be convenient if your mail reader could automatically sort incoming messages into folders based on subject lines or message text? Sorry. Exchange can't.

Improved Personal Address Book Services In its first incarnation, there's no way to import and export information from Exchange's Personal Address Book. Yes, other applications can add to the information in the Personal Address Book, but it sure would be nice to fill it automatically. In fact, why not steal a trick from ConnectSoft's E-Mail Connection and let Exchange automatically create a new Address Book entry whenever you receive a message?

A Bug-Free CompuServe Link The current beta of this much-needed link is so flaky that it might be yanked before Microsoft ships Windows 95.

A Consistent Interface Keyboard and mouse options in Exchange don't quite sync up with the rest of the products in the Microsoft world. In Word and WordPad, for example, Ctrl-F starts a Find operation. In Exchange, however, that keystroke combination forwards the current message. Similarly, right-mouse-button menus don't act the way they do in the otherwise identical Windows Explorer. For example, Exchange won't let you right-click to create a new folder, nor will it let you click on a folder and rename it directly.

Those quibbles don't keep Microsoft Exchange from being useful. But they sure do make an online addict wish that Exchange 1.1 would get here soon.



Mark Your Calendar: Inside sources say that Microsoft plans to formally announce Windows 95 and ship a few million copies of it all on the same day: August 24.

PHOTOGRAPH BY JAMES McGOON

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